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ABSTRACT

This monograph is an edited collection of some of the papers presented at the conference on "New Developments in Nutrition," held in London in 1983. One of the strengths of the conference was the diverse background of the participants, who represented more than thirty different countries. This diversity of interest and expertise is reflected in the texts in which those engaged in nutrition education examine, from a number of perspectives, a wide range of important issues in nutrition education. Discussions are included on the effectiveness of traditional nutrition education activities which have taken place outside the education sectors, and experiences are reviewed which have included extensive experimentation with new and different approaches, attitudes, and behaviors. The following issues and problems are addressed: (1) the importance of nutrition education; (2) teaching approaches; (3) teaching resources; (4) training and education of teachers and individuals; (5) use of mass media; (6) coordination of education agencies; (7) national and local level food and nutrition policies; and (8) evaluation of nutrition education. (JD)

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Issue 11

New developments in nutrition education

edited by Sheila A. Turner and Richard B. Ingle

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NUTRITION EDUCATION SERIES

11

New Developments in Nutrition Education

A monograph based on contributions
made to a conference held in the
Science Education Department of the
University of London Institute of Education
12 - 15 July 1983

Edited by

Sheila A. Turner and Richard B. Ingle
University of London Institute of Education

UNESCO NUTRITION EDUCATION PROGRAMME

PARIS

Division of Science, Technical
and Environmental Education

United Nations Educational, Scientific
and Cultural Organization

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FOREWORD

Recognizing the urgent need to improve the quality and effectiveness of in- and out-of-school nutrition education in both developing and developed countries, the University of London Institute of Education undertook to organize an international conference on new developments in nutrition education. Sheila Turner and Richard Ingle of the Institute's Department of Science Education assumed major responsibility for the preparation and execution of this timely conference and both are to be highly commended on all the work they did from planning and obtaining financial assistance for nearly all participants to the professional manner in which they conducted the conference and pulled together this monograph.

This monograph truly reflects the international spirit of the conference and covers key issues and problems facing nutrition education today: how to improve classroom nutrition teaching and learning at primary and secondary levels; how to incorporate effectively nutrition education into pre- and in-service teacher training; how to link in-school learning with out-of-school educational activities; how to make use of media and media support materials and how best to assess and evaluate nutrition teaching and learning.

Unesco was pleased to have collaborated and worked with the Institute of Education on the planning of this conference and it is hoped that in devoting this issue of the Unesco Nutrition Education Series to a report of the conference that even those who were unable to attend will be able to gain new insights and learn from the experiences of others as they work to promote and improve nutrition education at all levels, in all countries.

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The ideas and opinions expressed in this monograph are those of the authors and do not necessarily represent the views of Unesco. The designations employed and presentation of materials throughout the monograph do not imply the expression of any opinion whatsoever on the part of Unesco concerning the legal status of any country, territory, city or area of its authority or concerning its frontiers and boundaries.

EDITORS' PREFACE

During July 1983, as London basked in a heatwave with temperatures soaring to unprecedented heights, over a hundred delegates met at the University of London Institute of Education to attend a conference on 'New Developments in Nutrition Education.' This monograph is an edited collection of some of the papers presented at the conference. One of the strengths of the conference, remarked upon by many, was the diverse background of the participants, who represented more than thirty different countries. This diversity of interest and expertise is reflected in the text in which those engaged in nutrition education examine, from a number of perspectives, a wide range of important issues in nutrition education.

We should like to express our gratitude to all those whose support and encouragement enabled the conference to take place. In particular, we would like to thank the Director of the University of London Institute of Education and the Director General of Unesco, as well as Chief Ashamu, the British Council, the British Sugar Bureau, the Commonwealth Foundation, the International Council of Scientific Unions, Marks and Spencer PLC, the Nestle Company and the Overseas Development Administration for their generous financial help which enabled delegates from some thirty countries to join us in London. Lack of space prevents us listing all the individuals who assisted us with the organisation and running of the conference but we would particularly like to thank Professor Robbie Howat, our Conference Adviser, and Susan van der Vynckt of Unesco, for their wise counsel and unfailing assistance at all times. Our warmest thanks are also due to all those who gave papers, especially Sir Philip Rogers, Dr Hugh Sinclair and Professor John Waterlow for so ably setting the scene for us on the first day. And to our hard-working chairpersons and rapporteurs - Jean Anderson, Anne Coles, Mary Cursiter, Rajammal Devadas, Johanna Edema, Robbie Howat, Richard Loewald, Sajeet Malhan, Richard Orraca-Tetteh, Joan Peters, Doreen Parry, Susan van der Vynckt and Erica Wheeler - we extend our warmest appreciation. It is after all people who make conferences work. Finally we should like to thank Myf Garforth and Catharine Scudamore for the many hours which they spent in typing and preparing the manuscript for publication.

We hope that this book will provide an opportunity for those people who were unable to attend the conference to share in the talks and discussions on a subject which is of such importance for the welfare of people everywhere.

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Richard Ingle

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December 1984

CHAPTER 1

INTRODUCTION

Sheila A Turner and Richard B Ingle
University of London Institute of Education

One of the most important messages which consistently emerged at the conference held at the Institute of Education in July 1983 was the need in nutrition education to bring together all those engaged in education and health at different levels. Indeed one of the reasons for holding this conference was to enable experts from many fields - community workers, nutritionists and dieticians, educators in schools, colleges and universities - to meet to discuss matters of common concern. All too often, constraints such as those imposed by distance impede dialogue between groups and individuals engaged in similar enterprises. It also seemed a particularly appropriate time to consider new initiatives and examine current practice, for it is some years since the conference organised by the late Professor Francis Aylward was held in Oxford. Many of those who attended the Oxford Conference were able to be with us in London and to tell us about progress which has been made since 1977, and to remind us of the many problems which still remain. The conference also coincided with the publication by Unesco of the first of the Nutrition Education Series which was edited by Professor Robbie Howat. It must be admitted that four days was too short a time in which to explore fully the issues raised by participants. On the final day there was a plea for further meetings to be arranged at local levels in order to continue the discussion begun in July 1983. Regular meetings have already got under way at the London Institute of Education and also, we hope, elsewhere.

In the Opening Address, given by Sir Philip Rogers, who was formerly Permanent Secretary at the Department of Health and Social Security and Chairman of the Board of Management of the London School of Hygiene and Tropical Medicine, a number of points were raised which were discussed in greater depth by other speakers later in the conference. Sir Philip reminded us of the importance of giving advice which is correct as current science permits - a timely warning as our state of knowledge in nutrition, as in all the sciences, is always open to change. He alerted us to the dangers of research workers creating anxiety in those who are not 'experts'.

Sir Philip also touched upon economic and agricultural policy. In a developed economy the first need is to have an adequate income although this does not necessarily ensure a good diet. But in the subsistence economies found in many parts of the world today, the first priority must be to alleviate hunger. As he pointed out, there are some countries in the world where agriculture is concentrated on the production of luxury foods for export. This can be highly profitable but may lead to malnutrition among growers because of the lack of availability, either in price or quantity, of necessary foodstuffs. Another problem is that the importing of cheap foodstuffs on a large scale through aid programmes, can lead to a lowering of local prices. Local food production falls, local agriculture is impoverished, resulting in poorer nutrition and a poorer economy.

What people eat is also affected by social policy and current 'fashion', as well as problems of long-standing preferences, which are not based on any nutritional principles. Sir Philip discussed the changing patterns of household care and children's eating habits in the United Kingdom during the last three decades. Snacks, instead of a 'main' meal of meat and two vegetables, have become increasingly common but this change has occurred for reasons that have nothing to do with nutrition. The milk provided for children in British schools was originally introduced as part of a farm support policy, not for nutritional reasons, although this provision has now become one of the shibboleths of the welfare state. Partly as a result of such provision and of other changes in diet, there has been a steady improvement in the United Kingdom in height, weight and general physical growth of school children over a period of a generation. Sir Philip questioned the desirability of faster physical growth; could it perhaps be the cause of other problems? What is the relationship of physical growth to mental and, even more important, to emotional maturity? Has there been a change in that relationship over the last generation? Sir Philip suggested that there has been, and that it was something about which we know very little; it is part of a social problem in a developed economy which warrants research.

In conclusion, Sir Philip explained that nutrition is not solely a matter of identifying the best foods for physical growth and physical health. The subject also raises a range of fundamental issues of social and economic policy, from personal income and the availability of foods to standards of personal behaviour and family life.

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Prior to the conference we distributed a short survey questionnaire form to participants in over twenty countries. The survey was designed to alert us to topics which should be discussed at the Conference and to collect information about practice and priorities in nutrition education throughout the world. We are grateful to the respondents for their co-operation and for the time they spent completing the questionnaire.

Questions were asked about nutrition activities including the different contexts in which nutrition education occurs. We asked respondents to identify nutrition education priorities as well as particularly useful and innovative teaching methods and resource materials. We believe that the following issues and problems are representative of the concerns and interests of many nutrition educators.

Importance of nutrition education

There was widespread agreement over the importance and role of nutrition education. Reasons for teaching about nutrition were summarised by one Latin American respondent:

> 'Nutrition is taught so that families gain the understanding, knowledge, skills and attitudes necessary to act rationally in the selection, production, organisation, storage, preparation, distribution, consumption and safe-handling of food consistent with individual needs and available food and economic resources.'

Education in nutrition was seen as being essential at all levels of education. Nutrition appears in the formal sector of education as a component of courses in tertiary education such as Home Science, Economics and Biochemistry. In schools nutrition education rarely appears as a separate subject in the curriculum. It is often incorporated within themes in primary schools and within subjects such as science, biology and home economics at secondary level. Nutrition education could with advantage form part of a core of subjects in secondary schools which would include science, social and life skills - which would eliminate the 'sex' bias often apparent in some parts of the world! Nutrition education features commonly in community and extension education. Both of these were regarded as important elements of continuing education within the community, as were integrated programmes for children, parents and teachers. The potential value of relating school meal programmes and school garden projects with classroom teaching is also frequently overlooked.

Teaching approaches

Teaching approaches inevitably vary depending upon the target audience. The need to move away from rote learning to more active participation by learners has long been recognised. It was encouraging to note the frequency with which imaginative methods were reported by our respondents. Methods mentioned included the use of drama, practical investigations and visual aids which draw on the best of primary school practice. The implications for teaching at all levels are considerable and include in-service training for all those engaged in education and adequate financial and teaching resources. The best resources are frequently those developed locally as a result of discussion between individuals from local institutions and meetings between teachers.

Teaching resources

In many countries there is a lack of suitable teaching material of all types at all levels, particularly reference materials for teachers. Good, up-to-date materials for primary schools and textbooks in Science, Biology and Home Economics incorporating nutrition are also needed for use in secondary schools.

Training and education

Several respondents pointed out that it is important to distinguish between nutrition training and nutrition education. Agreement is needed about what should be taught at different levels of education. This means that there needs to be coordination between institutions involved in training. Many questions were raised such as: What sort of nutrition messages should be transmitted? How can teaching between different sectors be coordinated to make it more effective? How much should be included about modern controversy concerning aspects of nutrition? The social, cultural and economic factors affecting nutrition education were regarded as an important component of training courses.

Mass media

The power of the media in shaping peoples' ideas, values and practices relating to nutrition is unquestionable. Respondents identified the need for more effective use of the media to promote good nutrition.

Coordination of agencies

Many respondents stressed the need for inter-sector coordination between the different agencies involved in nutrition activities if their work is to be effective. Liaison between groups including government ministries, professional associations, teachers, extension workers and the mass media is essential.

Food and nutrition education policy

Many respondents stressed the importance of developing national and local level food and nutrition policies which include nutrition education in formal and non-formal sectors.

Evaluation

The need for effective process evaluation of all nutrition education activities, both in and out of school, was recognised.

The survey findings pinpointed many important issues and problems which were discussed in depth during the Conference. The wide range of topics covered in subsequent chapters reflects the multiplicity of concerns expressed by respondents. The importance of nutrition education is not disputed; the means by which the subject should and can be implemented is the subject of debate. A fragmentary approach to nutrition education has not brought about lasting benefits as was emphasised by Susan van der Vynckt and Richard Loewald in their report of the discussions on the workshop on Primary Education. It is becoming increasingly apparent that a multi-disciplinary, multi-dimensional approach is needed, which utilises existing infra-structures and available resources, and involves personnel from education, communication, health and other related sectors. It is important that an effective nutrition education strategy be planned, executed and evaluated as part of a total development process in both the formal and non-formal sectors.

CHAPTER 2

SETTING THE SCENE

On the first day of the conference Professor John Waterlow's admirable discourse provided an overview of the problems faced by those engaged in nutrition and education. He started by considering training and education. He used the analogy of a pyramid resting on its base in which it was possible to distinguish a number of different levels. At the top of the pyramid - where the word 'top' was used in a descriptive sense without implying the relative importance of activities at the different levels - were those engaged in 'higher level training in nutrition education' (a phrase used by the World Health Organisation and the International Union of Nutritional Sciences). At the bottom of the pyramid is nutrition education of people as a whole. The content of nutrition has to filter down in some way from the top to the bottom; as it does so training is somehow turned into education.

Professor Waterlow has been concerned in his career mainly with the pointed part of the pyramid, although he realised that most of those attending the Conference were concerned with education in the community. There is a connection, as educators have to be trained, and their effectiveness depends to some extent upon that training - as former students in the audience would testify. At the London School of Hygiene and Tropical Medicine, two kinds of people are trained. Firstly, there are those who already have a profession, including doctors and those going into administration, agriculture, planning or university teaching. Their reasons for taking the course vary; it may be personal interest or, more frequently, because their governments or universities feel that a good grounding in nutrition will enable them to do their job more effectively. Secondly, there are those who want to become professional nutritionists who will have the responsibility of training people at 'the next level of the pyramid' including school teachers, public health nurses and agricultural extension workers. Within the development of primary health care systems it will often be part of the nutritionist's task to train community health workers. They, in turn, will provide nutrition education for people in their communities.

A system of training at any of these levels requires three things from the trainers. First, a knowledge of facts and principles. Second, practical experience. And third, an appreciation of techniques and methods. This involves knowing how to make the training stick, an activity in which Unesco is very active. The mix of the first two elements - that is, of knowledge and experience - will vary with the level. The importance of an academic approach at the upper level of training was stressed by Professor Waterlow. It encourages not only understanding of basic principles and facts but also the ability to analyse and criticise. It is one of the functions of a university course and without it there can be no progress in knowledge.

At the more practical level, there is the problem which involves the degree of uncertainty which a person can tolerate. As an example, Professor Waterlow cited the need for a professional nutritionist to know that the protein requirement of a one-year old child is supposed to be

1.25g/kg body weight/day in order to be able to assess or prescribe diets. A well-trained nutritionist will know how these figures and requirements have been derived, and the uncertainties that are attached to them. Individual variation means that it is impossible to make cast-iron prescriptions for all cases. A good nutritionist will be able to live with these uncertainties; they attach to almost any quantitative estimates made in nutrition - and nutrition is at base a quantitative subject. Sir Philip Rogers had emphasised the changes in scientific opinion that result from these uncertainties by reminding us that today's dogma is tomorrow's fallacy. However, the nurses who are trained by nutritionists to operate in child welfare clinics probably do not have to know these figures although they do have to be able to recognise children who are not thriving, and how to deal with such problems. These nurses too have to live with some uncertainty. For example, it is frequently stated that exclusive breastfeeding is adequate for a period of 4 - 6 months. This is perfectly acceptable as a general guide for women under good conditions, but if such a statement is applied literally and universally it can certainly be dangerous since some babies undoubtedly need supplementary food before 4 months. A rule has to be taught but it is also necessary to teach that it may often have to be broken. That is not always an easy task in teaching.

The closer we get to the front line of action the greater must be the role of practical experience. As far as is known at present, no one is very clear yet about what should be the content of nutrition training for the primary health worker.

Professor Waterlow indicated that the only way to go forward is by exchange of experience. He mentioned how Dr Aroli, one of the pioneers of primary health care in Central India, is pictured sitting under a tree talking to his village health workers. Not only does he teach them every Saturday morning but he also gets feedback from them about what has happened to their cases during the week. The experience is so important because the person at the 'sharp' end, the village health worker, is dealing with individuals - and individuals differ enormously. Practical experience is of vital importance, as is feedback, if training and its content are to be developed in realistic and appropriate ways.

Professor Waterlow then went on to consider education within the community. He stressed that the problems facing those in the Western World are very different from those in the Third World. People in the Western World normally have enough money to choose what they want to eat. If they want to, and know how to, they can choose wisely. Frequently, however, unwise choices are made and it is here that there is a real role for nutrition education. But it is a difficult role because of the uncertainty of current knowledge. If it is suggested, for example, that individuals should reduce their salt intake in the interests of keeping their blood pressure down, then it is dificult to be precise about the amount of salt which can be safely consumed, as there are genetic differences between individuals in their susceptibility. The challenge to the nutrition educator is to provide clear guidance about something which is not very precise and clear-cut, and which probably never can be. The key to this particular problem, Professor Waterlow felt, is to teach nutrition in schools in a manner in which good nutrition goes hand in hand

Dr Aroli talking to village health workers in India

with some knowledge of science. He personally thought that nutrition education of the public, other than in schools, is probably largely a waste of time, leading, as Sir Philip Rogers had said, to food fads, exaggerations and neuroses. It is obviously a highly controversial opinion.

In the Third World, the conditions are obviously quite different because there are three constraints, namely lack of money, lack of time and lack of knowledge. It is the last one with which we are mainly concerned in the Western World. Nowadays, at any rate in Britain, people have enough money to choose their food, but this has not always been the case. The following passage comes from a pamphlet written only 70 years ago, in 1913, by Mrs Pember Reeves, called 'Round about a pound a week':

> 'That the diet of the poorer London children is insufficient, unscientific and unsatisfactory is horribly true, but that the real cause of this state of things is ignorance and indifference of their mothers is untrue. What person or body of people, however educated and expert, could maintain a working man in physical efficiency and rear healthy children on the amount of money which is all these mothers have to deal with? It would be an impossible problem if set to trained and expert people. How much more of an impossible problem when set to the saddened, weakened, overburdened wives of London labourers.'

That was 70 years ago, but the description could be used in reference to many Third World countries today.

Next, there is the constraint on time, which Mrs Reeves mentioned, and which has largely been eliminated in industrialised countries by labour-saving devices and so on. But in the Third World, the demands on a woman's time are truly tremendous - cultivating the fields, collecting fuel, fetching water, pounding grain, cooking, looking after children who are often sick, and so on. On top of all this, the mother - the woman, the person who really runs the family - is told to do extra things, such as preparing special weaning foods, boiling all drinking water, feeding children fives times a day (because their stomachs cannot take enough food), improving personal hygiene, stimulating children and spending more time playing with them, and so on. It is a totally impossible task.

It is against this background that one has to consider the question of how far ignorance, and therefore education to counter that ignorance, are of importance, and what education can be expected to achieve.

The constraints of poverty and ignorance, obviously differ in different communities. To educate effectively you have to know your community as opposed to laying down dogmatic rules, and also to bear in mind the importance of practical experience. Such experience will no doubt show that one has made many mistakes as one goes along but, as Sir Winston Churchill once said, there is no diet so nourishing and so stimulating as to eat one's own words. A remark which is profoundly true.

In his talk, Professor Waterlow gave us an insight into some of the fundamental problems faced by those engaged in nutrition education. The papers which follow provide further evidence of the diverse and complex nature of the subject. The contributors in this chapter set the scene for later papers where many of the topics touched upon are examined in greater detail.

Contributors

2.1 Hugh Sinclair	Human deficiency problems and their consequences
2.2 David Morley	Approaches to non-formal nutrition education
2.3 Erica Wheeler	Realism in nutrition education
2.4 Ron Israel	Ways of improving the effectiveness of nutrition education in developing countries
2.5 Mark Mosio	Food and nutrition problems and their solution
2.6 Dorothy Hollingworth	Nutrition education - the work of the International Union of Nutritional Sciences
2.7 Marian Zeitlin	The two worlds of nutrition education: similarities and differences between industrialised and developing countries
2.8 Vivienne McLoughlin and Jim Davies	Conceptual barriers to the promotion of 'healthy eating'

2.1 Human deficiency problems and their consequences

by

Hugh Sinclair
International Nutrition Foundation, Abingdon, England

The nutrition problems throughout the world are sharply divided into two. By far the most important, quantitively, are those in the developing countries which contain some two-thirds of the world's population, particularly starvation in adults and protein-energy malnutrition in children. I would like to pay tribute to Dr Cicely Williams, who discovered the cause of kwashiorkor in the early 1930s. That was a great achievement. But I believe an even greater achievement of Dr Williams was to institute the 'Well Baby Clinics' in what is now Ghana during the 1930s. She encouraged mothers to bring their babies to these clinics to be admired by her when they thought they were perfectly well. And in that way she picked up 'faults' in the babies which she could correct by giving advice to the mothers before the babies became moribund. Previously, the mothers had brought the babies when they were beyond medical assistance - they would be admitted to hospital and die two weeks later.

Another very serious problem in certain parts of the Third World is vitamin A deficiency, which can usually be prevented by proper education of the mothers. There is the desperate problem of blindness in children, which I have had the opportunity of working on in southern India. I would like to pay tribute to the work of the eye clinics, which consist of an ophthalmologist and usually three other people - a nurse to help with eye operations, a nutritionist and another worker. They set up camp and people come from the surrounding area for treatment. These eye camps are not only combatting xerophthalmia by the injection of vitamin A and performing eye operations such as cataract and corneal transplants, but they are getting across nutrition education to the people. This has proved to be a very effective way of imparting nutrition education. They do a wonderful job.

I turn to the nutrition problems in the privileged countries such as Britain, in which it is usually assumed that there are no severe nutritional problems. I would like to point out that the expectation of life of a fifty-year-old man in Britain is almost exactly the same now as it was when statistics started with William Farr in 1841. It was then 20.0 years; it is now 22.7 years. That means that we cannot now do much more in clinical medicine in this country to keep a middle-aged man alive than we were able to do in the dark ages of medicine in 1841 - before anaesthesia, antiseptic surgery and all the drugs we use today. Further, if one looks at what most middle-aged men were dying of then, it was either tuberculosis or acute lobar pneumonia. The incidence of both these diseases has been dramatically reduced yet, remarkably, the expectation of life has remained roughly constant. Clearly, something has risen dramatically and that has been the chronic degenerative diseases (sometimes called the 'western diseases') particularly heart disease and cancer. If certain diseases are increasing quite rapidly in a country such as Britain, but not prevalent in the developing countries, there must be a cause for this. In my opinion, the cause must be nutritional. I tried as a student to see what that might be, and I concluded that it might be the type of fat in our diets. If we look at this longitudinally, we find that deaths from, for instance, coronary heart disease have not been rising steadily in European countries. They started to rise in the 1920s. During the Second World War there was a dramatic fall in the Scandinavian countries, in Holland, in Germany and in England and Wales. But as soon as the European war ended, they rose again. The fall during the war years was due, I believe, to a change in diet. But it is interesting to note that in Britain, the rise in deaths attributed to coronary heart disease occurred in 1943 rather than in 1945 when the war ended. That was the year when the diet of this country had changed quite dramatically as a result of food coming in from America under 'Lease Lend'. The imported food included fat bacon, hydrogenated margarine and a curious food called Spam! All contained large quantities of saturated fat. Coronary heart disease is partly a question of furring-up of the arteries, known as atherosclerosis. But more important is the thrombotic element in the blood. Atherosclerosis is a chronic process, yet thrombosis (clotting) can rapidly be altered by changes in diet and in particular by changes in the type of fat. Epidemiological evidence indicates that coronary heart disease is strongly associated with a high ratio of the consumption of saturated fats to certain polyunsaturated ones. Some forty years ago, I lived with Eskimos because I was fascinated by the fact that they had the highest fat intake in the world, relatively very high in polyunsaturated fat - the right type of fat. Significantly, Eskimos then had none of the western diseases. They were strict carnivores and were totally free from multiple sclerosis, malignant disease and coronary heart disease. Just after the turn of the century, my friend Sir Robert McCarrison lived for seven years amongst the Hunzas in the Himalayas. Unlike the Eskimos, the Hunzas are almost entirely vegetarian and are very long-lived people. During this period, as the only medical officer amongst them, he hardly ever encountered a case of the degenerative diseases. This is a very striking fact. So it is not a question of being vegetarian or carnivorous, but rather of the type of fat in the diet.

Considering cancer, I note that Sir Richard Doll has as a result of extensive epidemiological studies come to a similar conclusion as that which I suspected some thirty or forty years ago. He considers that between 10 per cent and 70 per cent of all cases of cancer are nutritional in origin and therefore preventable. In developing countries, primary cancer of the liver from aflatoxin is common in certain places, and a virus form of cancer known as Burkitt's lymphoma is also common. But the western types of cancer are very rare. Japan is a particularly interesting country: although it is highly developed it has a very low incidence of the western diseases with two important exceptions: strokes and cancer of the stomach, the incidence of which is high, due probably to the large amount of salt in their diet.

I would like to concur with John Waterlow that there is a great deal of uncertainty in knowledge of nutrition, and that further research is much needed. Nevertheless, I believe that we already have sufficient understanding of nutrition to teach it to good effect at all levels. This is particularly the case with children who are able to bring back to their mothers what they have been taught at school. In 1977 UNESCO with IUNS organised the first large international gathering devoted specifically to education in human nutrition, the proceedings being published by Professor Howat and myself in 1980. UNESCO is doing splendid work with its Nutrition Education Series. We need more teaching of nutrition in schools; we need to teach nutrition to medical practitioners at the preclinical, clinical and postgraduate stages of their education. Our object is to promote health and prevent disease, and in this nutrition plays the major part.

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2.2 Approaches to Non-Formal Nutrition Education

by

David Morley
Professor of Tropical Child Health, University of London

A colleague of mine, Dr John Ratcliffe, heads a department of health education at the University of Pittsburgh. In conversation recently he informed me that his department had decided on a new approach to effective health education. No longer would their primary effort be the education of the impoverished farmer or slum dweller in developing countries but, instead, to influence the national decision-makers. As he so rightly mentioned, most of us could not survive in the situation of the poor and there is probably much that they could teach us. My presentation will aim to show why and how we also need to aim our education in nutrition at district and national decision-makers.

Early Childhood Nutrition: A National Priority

Because of their orientation to curative medicine doctors have laid emphasis on the 1%-5% in an undernourished population who have the severe illnesses of kwashiorkor and marasmus. Unfortunately, too little emphasis has been placed on nutritional stunting. In some developing countries over 80% of the children will show mild or severe stunting. This is usually recognised when the child reaches the age of two or three and yet the damage to the future nation may occur before birth and in the first one or two years of life in its effect on the children's brains. (Figure 1). During this time the brain is growing rapidly and, perhaps even more important, the complex linkages between the brain cells should be taking place.

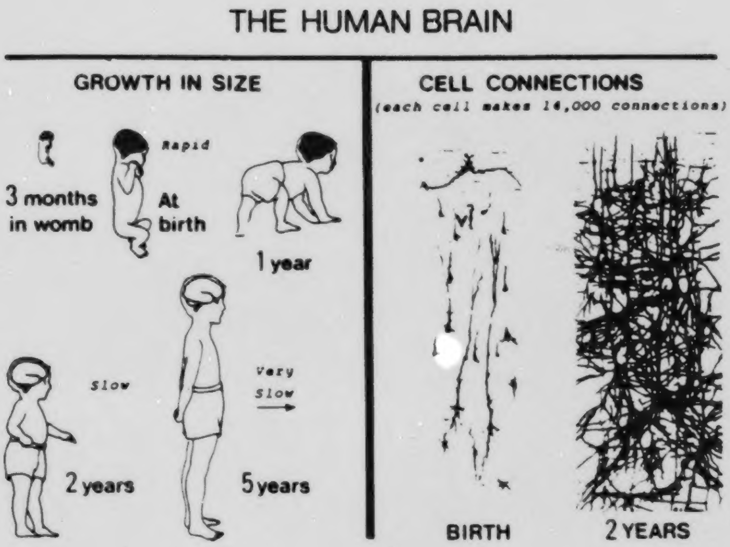


Figure 1 The brain grows rapidly during pregnancy and up to the second birthday. After that, growth is slow. At the same time the synaptic connections between the brain cells occur between birth and two years.

An ancient Chinese saying goes:

> 'A bird's beauty lies in its feathers, but a man's beauty in his knowledge.'

National development must depend on adequate brain growth and subsequent intellectual development of the young children. This priority for nutrition and a stimulating environment is emphasised and expanded in a study of the following trial from Cali, Colombia. (Figure 2). In this trial sixty children from malnourished families were provided with combinations of a simple comprehensive health care, adequate nutrition, and a stimulating environment. There was a control group of sixty children from the elite of that society. After two years there was little change in those who had just comprehensive health care. Those who had comprehensive health care and adequate nutrition caught up in their growth with the elite; however, there was little change in their intellectual development. The third group which received simple comprehensive care and adequate diet and a loving and stimulating environment caught up almost completely in growth and intellectual development with the elite. The overall priority can then be identified as - first, adequate food intake: however, this is difficult unless illnesses are prevented and treated by simple comprehensive care. For full intellectual development a stimulating and loving environment along with nutrition and comprehensive health care is required.

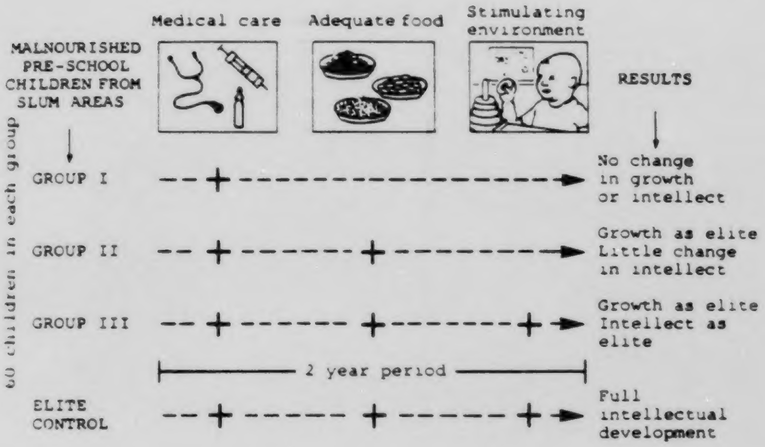

Medical care
Adequate food
Stimulating environment
MALNOURISHED PRE-SCHOOL CHILDREN FROM SLUM AREAS
60 children in each group
RESULTS
GROUP I
No change in growth or intellect
GROUP II
Growth as elite Little change in intellect
GROUP III
Growth as elite Intellect as elite
2 year period
ELITE CONTROL
Full intellectual development

Figure 2 The priority need for children is adequate food, but as well as this we need health care for growth. However, for full development we also need a loving and stimulating environment.

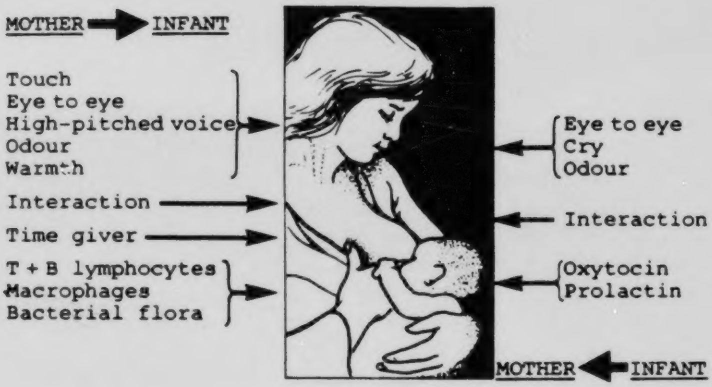
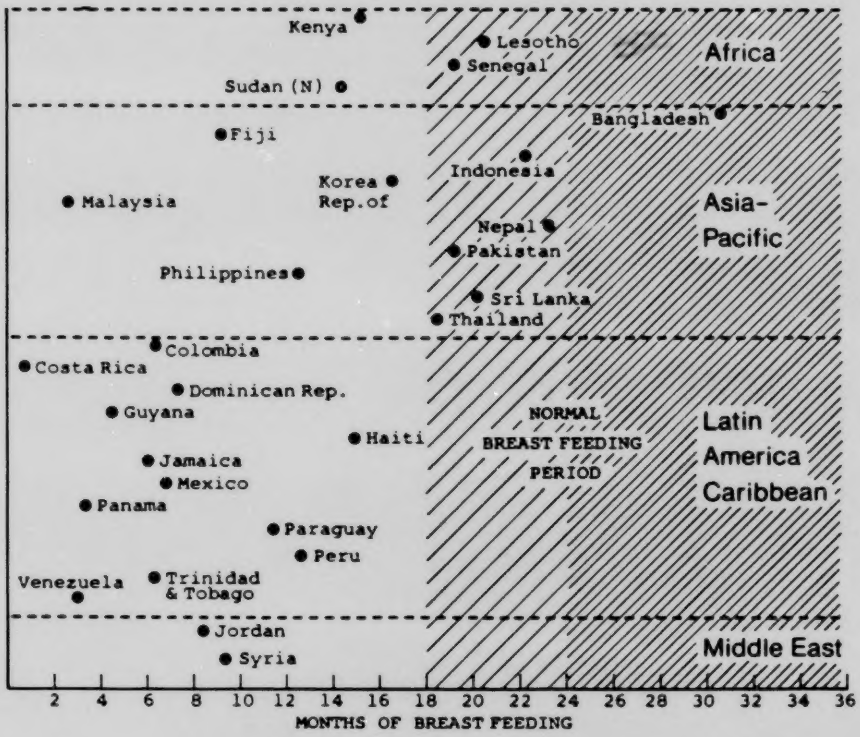

MOTHER → INFANT
Touch
Eye to eye
High-pitched voice
Odour
Warmth
Interaction
Time giver
T + B lymphocytes
Macrophages
Bacterial flora
Eye to eye
Cry
Odour
Interaction
Oxytocin
Prolactin
MOTHER ← INFANT

Figure 3 Much of the interactions and bonding that occur between mother and child depend on successful breastfeeding.

Only in the last ten years have we come to discover the advantages to mother and infant of successful breastfeeding. (Figure 3). Breastfeeding is an important part of the bonding between mother and child, on the success of which most of our relationships as children and adults in the future will depend. We, in Europe, have slipped away from the understanding of breastfeeding as the strong bond between mother and child for the first two years of life. Fortunately, many of my university colleagues with small babies are now breastfeeding their children in excess of one year. The way in which breastfeeding has declined across many nations was brought out by the world fertility survey last year (Figure 4). Only in Bangladesh could they find a median period of breastfeeding still over two years.

The same study also brought out in the same country the importance of breastfeeding as the main reason for longer birth interval and a major contributor in preventing infant death. In Figure 5 it will be seen that in families where breastfeeding is unsuccessful and there is a shorter birth interval, the mortality of children may be more than twice as high.



Median length of breast feeding

World fertility survey (Ferry B. Smith D. 1982)

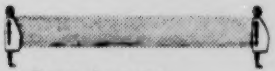
Figure 4 Results from a recent World Fertility study show that the median period of breastfeeding for most countries has slipped away below the 'normal' period of between 18 months and 2 years.

Content of Nutrition Education: Adequate Energy Intake

Most western diets are distinguished by a high content of animal protein. For a quarter of a century the assumption was made that in developing countries the major change necessary in children's diets for adequate growth was primarily an increase in protein: particularly animal protein intake. For the last ten years opinion has swung round to the view that inadequate growth and stunting of development arises largely as a result of an inadequate energy intake. Both adults and children in developing countries live largely on coarsely ground staples with a low oil or fat intake. As a result the small child aged two in developing countries who requires an energy intake of just over 1,000 calories a day would have to eat the impossible amount of over a kilogram of the local staple in the form of a porridge. (Figure 6) Fortunately, as shown on this figure the volume can be reduced to that of a western diet by adding oils and fat which by reducing water content greatly reduce the bulk of the food. In most societies a satisfactory protein intake can be achieved by a quarter of the dry staple being in the form of a legume.

SPACING BIRTHS: REDUCES DEATHS

Bangladesh: World Fertility Survey. Rutstein '82

Spacing between birth	Infant Deaths /1000 births	Toddler Deaths /1000 alive	Child Deaths /1000 alive
	0 - 1st. birthday	1st.- 2nd. birthday	2nd.- 4th. birthday
Less than 2 years	185	42	81
2 - 4 years	89	28	62
 Over 4 years	58	10	27

Twenty nine other countries showed similar trends

Figure 5 Adequate birth spacing is one of the most important variables affecting child mortality.

Monitoring the Growth of Children

Simple growth charts are now accepted by organisations such as W.H.O. and UNICEF as essential tools in the monitoring of early childhood growth (Figure 7) Only by showing the adequate growth of the whole child can we be sure that her brain's growth is adequate. Unfortunately, in most developing countries even amongst health workers, the significance of a growth curve is not easily understood. Perhaps we need to turn to our colleagues in education to help to bring to communities an understanding of the symbolism of charts and diagrams earlier in the education of children.

By monitoring the growth of children we are not just seeking to identify those who are growing inadequately, but rather those families in which the children are growing adequately in spite of the adverse local conditions. Perhaps the latter are those who can give the best encouragement and help to the mothers who have problems in the growth of their children.

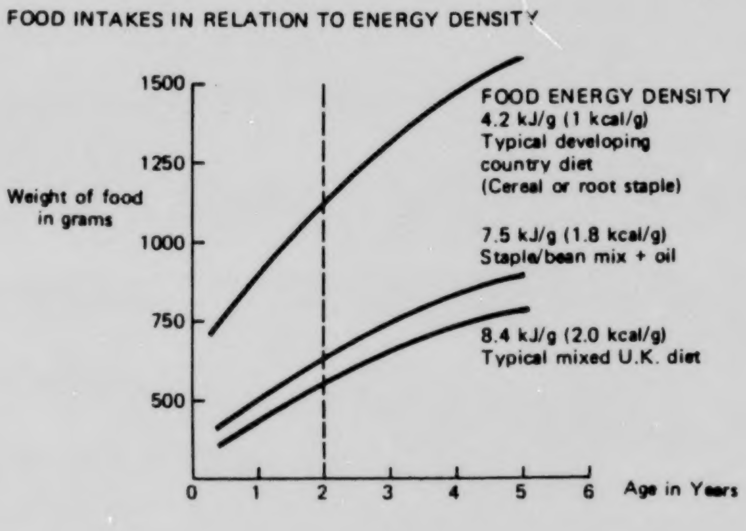


Figure 6 The relationship between the weight of food a child has to consume each day and her age. On a typical root or cereal diet a child would have to eat more than a kilo of food a day.

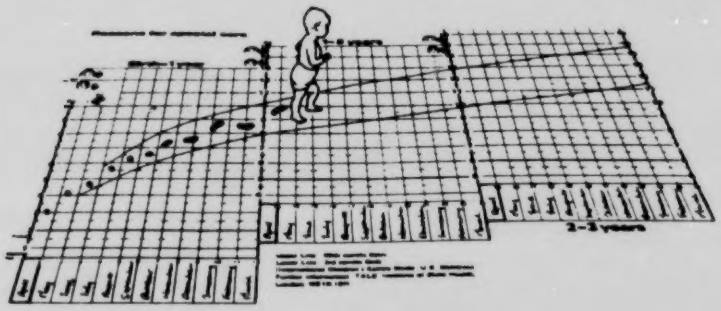


Figure 7 The simple form of weight chart widely used around the world. Such charts will identify the more successful mothers who can help their sisters whose children are not growing so well.

Simple Comprehensive Care

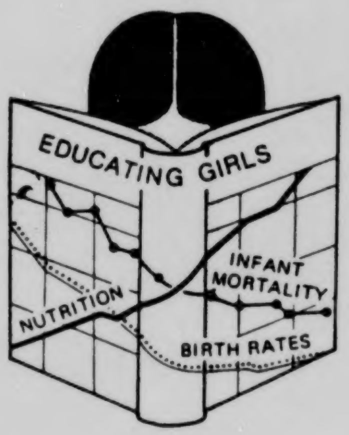
Success in nutritional programmes will not be achieved without care of common conditions such as diarrhoea and the prevention of illnesses such as measles and whooping cough which precipitate so many children into malnutrition.

Every minute ten children in our world die and are being buried by their parents. These children have died from dehydration and diarrhoea. I could take you to villages in Mexico, Africa and India where such deaths hardly occur, and diarrhoea is treated by the family and perhaps the village health worker in the community. The new knowledge on how to overcome the harmful effects of diarrhoea is perhaps the most important discovery in the health field this century. I fear historians will be surprised at how dilatory we were in passing this information on to the mothers and families where this new knowledge can be life-saving. The ingredients for the management of dehydration - water, salt and sugar are present in the majority of homes in our world. Unfortunately, we fail to know how to pass on the knowledge and skill in order that deaths from diarrhoea can be prevented.

The W.H.O. estimates that out of every 1,000 children born in the developing world today, five are likely to go through life with severe disability from poliomyelitis; ten will die from tetanus of the newborn; twenty will die from whooping cough; and thirty as a result of measles. We have low cost tools in the form of vaccines which will prevent all of these at a cost of £1.75 per child. At the same time their prevention will improve nutrition of the child at relatively low cost.

Education of Girls

The World Bank has shown that there is a strong correlation between education of girls and deaths amongst children between birth and first year (Infant Mortality Rate). They find that for every year of girls' education we can expect the Infant Mortality Rate to be reduced by nine points (Figure 8). Many countries have an infant mortality rate at 90/1,000 or above; for a country where the level is 90, five years education for all girls might be expected to halve the infant mortality rate. We cannot say that we do not have the resources.



THE EDUCATION OF GIRLS
IS CLOSELY ASSOCIATED
WITH A FALLING INFANT
MORTALITY AND BIRTH RATE
AND IMPROVED NUTRITION

Figure 8 Success in national development will rest largely on the better education of girls.

THE CHOICE IS OURS

It costs about as much to:

Arm and train one soldier	as to provide education for 80 children
Construct one nuclear submarine	as to build 450,000 new homes
Produce one jet fighter	as to equip 40,000 village pharmacies

Health and Education for Rural Areas

We, in the Institutes of Education and Child Health in London University are proud of our CHILD-to-Child Programme. The programme was initiated through the activities of these two institutes and is now a self-perpetuating programme that has spread in many countries. Older children already care for a high proportion of small children in their societies; the CHILD-to-child programme aims to improve their knowledge and abilities in protective feeding, stimulating the small infants left in their charge (Figure 9).

Figure 9

The Logo of the CHILD-to-Child Programme established between the Institutes of Education and Child Health of London University for the International Year of the Child 1979.

Perhaps we can now look to the success in China and think back to Mao Tse Tung's speech in 1965. In castigating the Ministry of Health and the medical profession he said:

> '.....three years are enough. The important thing is to study whilst practising. This way, doctors sent to the countryside will not overrate their own abilities, and will be better than witchdoctors, or doctors who cheat the people........In medicine and health put stress on the rural areas.'

Perhaps one key to developments in both health and education in rural areas and the spreading slums of developing countries is through distance learning (Figure 10). We, in the United Kingdom have particular expertise through our Open University and other organisations in this field. An appropriate distance learning programme would be targeted on those working in rural areas who in both health and education are the least privileged at the present time. Through them we may create a revolution in health and education, for the people they attempt to serve.

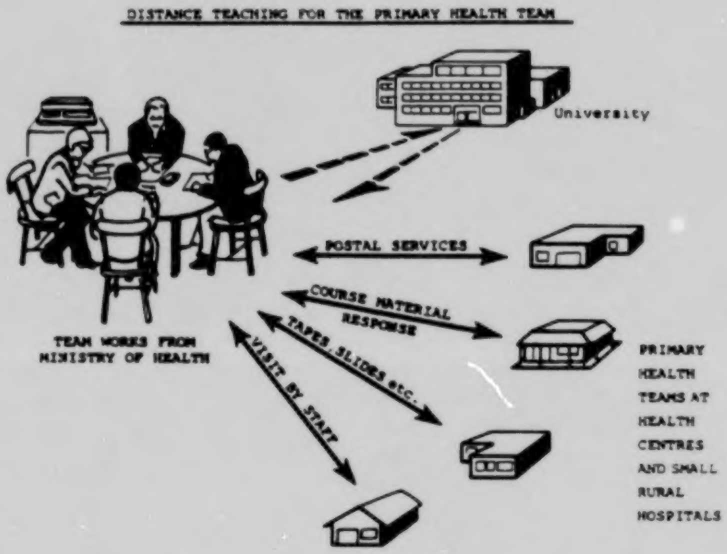

DISTANCE TEACHING FOR THE PRIMARY HEALTH TEAM
University
POSTAL SERVICES
COURSE MATERIAL
RESPONSE
TAPES, SLIDES etc.
VISIT BY STAFF
TEAM WORKS FROM MINISTRY OF HEALTH
PRIMARY HEALTH TEAMS AT HEALTH CENTRES AND SMALL RURAL HOSPITALS

Figure 10 A distance learning team separate from the university and medical school can bring better education in health and nutrition to those in health and education working in rural areas on whom so much depends.

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2.3 Realism in Nutrition Education

by

Erica Wheeler
Department of Human Nutrition
London School of Hygiene and Tropical Medicine

The Context: causes of malnutrition

Two simple questions are central to this paper. First, do nutritionists accept that malnutrition has multiple causes? Secondly, if they do, how can we explain the persistence of nutrition programmes which are directed towards one, and only one, causative factor?

It is nothing new for some individuals to realise that the causes of malnutrition are many and complex, and for others implicitly to deny this. It was in 1937 that Boyd Orr analysed the food purchases of British families at varying income levels, and concluded that half the population could not afford an adequate diet. In discussing his findings he mentioned housing, 'other features of the environment', and the social conditions prevailing in the slum districts, as factors contributing to malnutrition. On the other hand, a text book published twenty years later stated flatly that 'if a family is not taking a satisfactory diet, it must be due to poverty or ignorance' (Davidson, Meiklejohn and Passmore 1959; my italics). In the 1970's and 80's much has been made of the complexity of causes of malnutrition, and rightly so. In a 1970's public health textbook we find: 'Activities that can be undertaken today aimed at the control of some of the factors that precipitate acute malnutrition ..... can improve the picutre ..... but we also recognise that a real and lasting improvement in the underlying conditioning factors requires major social and economic changes...' (Beaton and Bengoa 1976; my italics). There seems to be little controversy surrounding such statements. Yet at the same time, 'single factor interventions' persist: that is, programmes which are targeted on just one of the contributory causes of malnutrition. Why is this? And why is nutrition education such a common example of the 'single factor' approach? Do nutrition educators secretly reject the current orthodoxy, that malnutrition is a multifactorial problem? (In discussing nutrition education I shall refer to adult non-formal nutrition education (ANFNE) and leave aside the question of nutrition as a legitimate part of school and college curricula).

Objectives and outcomes of nutrition education

It seems self-evident that if adult non-formal nutrition education (ANFNE) is to be done, it should be directed towards a group of people who have a recognisable and measurable nutrition problem. If they have no nutrition problem then to give nutrition education is a waste of scarce resources. For an example of a group of people whose knowledge of nutrition (in the conventional Western sense) is very poor, but who have good nutritional status, and need no ANFNE, we can take the present adult generation of Chinese immigrants in London (Tan and Wheeler 1983). They are raising healthy, well fed, well nourished children, although they follow a system of food values which is quite different from that taught to the Westerner. Nothing would be gained by giving them nutrition education, as no change in their own or in their childrens' nutritional status is needed.

If ANFNE is to be given at all it should be to a group of people whose nutritional status is measurably poor, and it should be evaluated in terms of improvement in nutritional status, not simply in terms of increased knowledge. As Zeitlin and Formacion (1981) observe: 'No matter how impressive our successes are in changing reported nutrition attitudes, knowledge or behaviour, if these do not improve physiological indicators of effectiveness, we have failed to reach our final objective'.

Yet such failure often occurs and has been well documented. Two examples will suffice. Evaluation of a community nutrition education in Jamaica showed that although women understood the messages, rising food prices prevented them from putting them into practice (Antrobus 1975). Similarly, a radio nutrition education programme in the Philippines failed to have any impact on children's nutritional state, because the message ('put a little oil in your child's rice porridge') called for use of what was perceived as an expensive food, and women simply could not afford it (Zeitlin and Formacion 1981). The reasons for these failures are not technical: the messages were presented and understood. Failures can be explained in terms of a simple model (Figure 1) of food choice and its interaction with nutritional status.

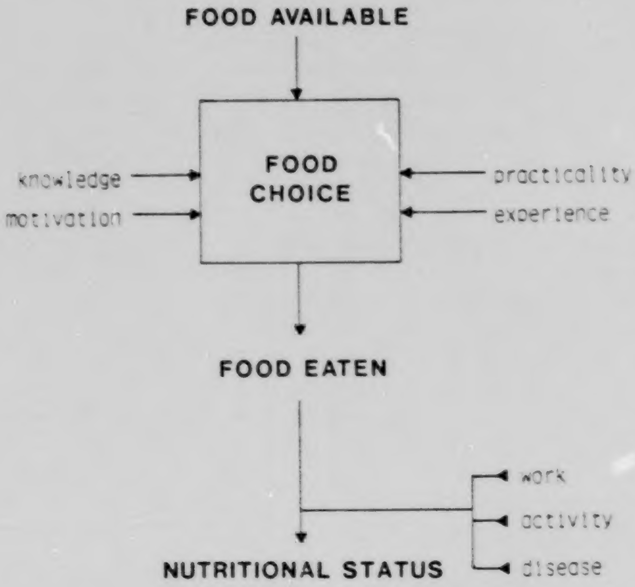


Figure 1 Schematic diagram of factors affecting food choice and nutritional status.

Food choice is only one of the factors affecting nutritional state, and only some aspects of food choice are addressed by nutrition education. These are 'motivation and knowledge', for clearly 'practicality', the capacity to carry out a particular choice, is not affected by education; and 'experience' is the product of past choices and behaviour. In the examples given above, projects failed because the practicality factor was unfavourable. Mothers were simply unable to consider implementing the message because they had not sufficient spare resources, and so their increased knowledge, and possibly increased motivation, were redundant. Nutrition education may indeed change people's knowledge about food, and their motivation to choose certain foods rather than others. But in order to show that nutrition education has been effective, we must be able to demonstrate changes in nutritional status, or in the prevalence of malnutrition, as well as in knowledge and motivation. The 'practicality barrier' is extremely important. Even in affluent societies, it may be practicality rather than knowledge or motivation which prevents people from reducing energy or fat intake: it may be that the time needed to prepare fresh food, for example, is a constraint for a working mother.

The model in Figure 1 asserts that malnutrition does have multiple causes, and the immediate deduction from this must be that single-factor interventions will have no impact on the prevalence of malnutrition. Thus the logic of accepting malnutrition as multi-causal, and experience gained in the field, both lead to the conclusion that nutrition education, by itself, cannot have favourable impact on the prevalence or severity of malnutrition. To reduce malnutrition, 'practicality' and environmental/disease factors must also be attacked.

Why the persistence of nutrition education?

If this is the case, then why does nutrition education persist as a single-factor intervention? Why do nutritionists and educators continue to seek out groups of poor women and set impossible goals before them? Why are we satisfied with this kind of activity? Why are we satisfied with attempting to produce changes in knowledge which can have no possible effect on malnutrition? To answer this it is necessary to revert to an earlier question. Do nutritionists accept that malnutrition is multi-causal? If they do, then the persistence of single-factor interventions of any kind can be explained only as a despairing insistence that we should continue to attack intractable problems, or as an illogical response to the fact of limited resources. However, there is the alternative explanation: that among many nutritionists, as among medical, nursing and other professionally trained people, there is profound reluctance to discard the idea of 'ignorance' as the *primary* cause of the problems of the poor. I am basing this assertion partly on my experience of discussions and conversations with nutritionists and health workers from a number of countries, and partly on reading the literature on malnutrition. Again and again there is a brief perfunctory mention of 'poverty', followed by a lengthy treatment of the need for increased knowledge, better 'practices', behaviour modification and so on. Many nutritionists show apparent insensitivity to the complex social and economic problems which grip the poor and contribute to their malnutrition, and continue to speak and write as though individual ignorance, wrong-headedness and stubbornness about food can account for their malnutrition. One recent and expressive instance of this attitude is seen in the following extract: 'The majority of mothers recruited were in the lower socio-economic groups: Forty per cent of the sample were unemployed. Forty-six per cent were single at the beginning of pregnancy. Almost one third lived with their parents or other members of their family. Often they were under considerable stress mainly due to poverty, housing problems or conflict with family or boyfriend. *Their problems were often of their own making*. For example a 19-year old, single, unemployed, homeless, expectant mother spent £13 on a hair-do and then could not afford any meat, fish, cheese or eggs for three days. Sometimes they appeared to be, at least partly, victims of circumstance: one 17-year old, single unemployed girl was forced to leave home due to her mother's violence towards her on discovering she was pregnant.' (Doyle, Crawford, Laurence and Drury 1982; my italics). The phrase 'of their own making' carries the implication of blaming the young woman for her response to social dilemmas which must have been almost beyond bearing, and for which she can in no way be held to be individually responsible.

Of course, there is nothing new in 'blaming the victim': it is a mental and social attitude which has long been displayed in the West. In part, it reflects hostility of the taxpayer to people who receive public assistance of any kind. Golding and Middleton (1982) have analysed the attitudes displayed in Britain, through the media, to welfare beneficiaries. These attitudes include concepts of 'the good (deserving) poor' and 'the bad (idle) poor' and a general assumption that if poor people suffer distress, it is very likely to be their own fault and the result of some kind of bad management. 'On the one hand it is widely believed that little or no poverty persists other than an unavoidable degree of hardship in old age. On the other hand, where poverty is recognised, it is explained in terms of the individual culpability of its victims. Firmly wedded to an absolute rather than a relative standard of deprivation, most people deny that serious poverty exists, and see little gap between the circumstance of those on the lowest incomes and the rest of the population. Poverty like wealth, attaches to individuals and has no single relation to larger movements or processes in society. Far more people relate poverty to the inefficient consumption of incomes, rather than to their inegalitarian distribution in the labour market and from the ownership of wealth.' In the case of malnutrition it is assumed that money is being misspent, or that sheer ignorance prevents mothers from feeding themselves and their families well.

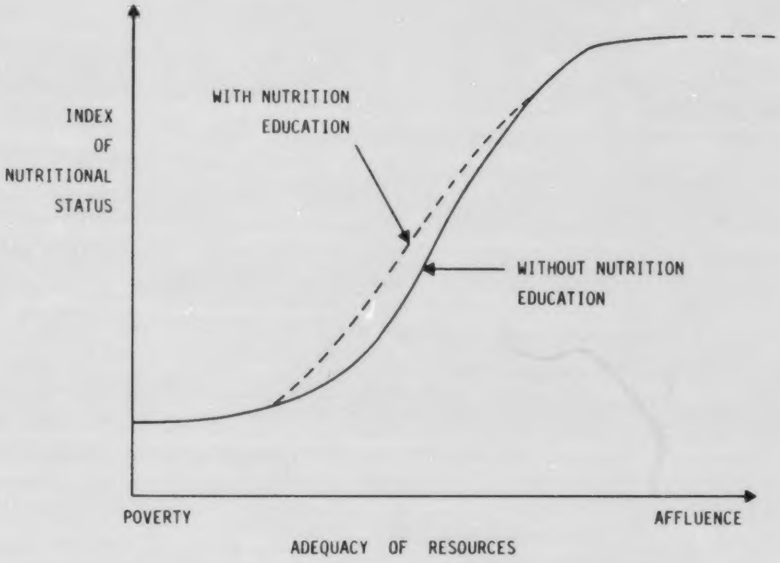
That debates about the justice and realism of such attitudes are not new is shown, for example, by work in the early 1900's, on the household budgeting of poor London families (Pember Reeves 1979). Conventional wisdom said that the poor were thriftless and shiftless, and blamed their illness and malnutrition on their own behaviour. Pember Reeves showed clearly that, given current wage levels and the cost of essential items such as rent, work clothes and fuel, it was impossible for some artisan families to feed their children adequately. Similarly in the 1960's it was necessary for Church and Walker (1978) to show that the level of child benefit was simply not sufficient to meet the cost of feeding a school-aged child. Yet there is a persistence of the idea that if only the poor would agree to 'spend wisely', and to adopt 'healthy eating' practices, they could improve their own health and wellbeing without additional expenditure of cash or other resources; and that there is no need to ask whether their resources can support a socially acceptable standard of living. I think that nutritionists, among other professionals, have fallen into the old trap of 'blaming the victim'. This may have certain advantages in assuaging uncomfortable feelings of collective guilt or responsibility, but it leads to ineffective policies and programmes, and frustration for implementer and recipient alike. A more positive approach is to accept a realistic analysis of the social and economic roots of malnutrition, and indeed of poverty, and then to assess the possibilities for co-ordinated attack on the complex of causative factors.

How can nutrition education become effective

If we accept that malnutrition is multi-causal, then the final question must be 'under what circumstances might nutrition education contribute to improvements in nutritional status?' In terms of the 'model' (Figure 1), the conditions for success must be that the 'practicality' and 'environmental' factors are favourable. Changing knowledge will have no impact unless it is practicable for people to put this knowlege into effect, and unless the benefits are not nullified by disease. To put it another way, nutrition education increases one resource: knowledge. Unless other resources are increasing at the same time, increased knowledge cannot be used; indeed, lack of knowledge may not have been a constraint in the first place.

What kind of resource change might enable increased knowledge of nutritional principles to be put into practice? The main constraints to good eating are money, time, labour and fuel. If income is increasing, or if food prices fall, or if women's work load is decreasing, or if fuel supplies improve, it may be possible for the family diet to change. This of course is not necessarily contingent on increased nutrition knowledge: many poor people know what a good diet is, but are unable to provide it. But there may be scope for improvement. In Figure 2 I have indicated schematically the role that nutrition education might play.

Figure 2 Possible contribution of nutrition education to improved nutritional status



When people are simply too poor to get a good diet, education will be no help to them. When they are reasonably affluent, they will get a good diet anyway until problems of overnutrition take over; and nutrition education may well become effective from there on. But there is also a stage where increased knowledge may indeed contribute to a better use of those new resources. Some examples of such a situation are: where rural people migrate to work in cities and have to come to terms with urban lifestyles and the cash economy; income generating programmes, especially in agriculture, where guidance may be needed over the balance of cash crops to food crops; resettlement programmes where people have to get used to new food crops. Where other influences are causing change in the balance of resources, then nutrition education may play a useful part. Its planners should, of course, be responsive to the real needs of the people involved, which will vary according to the nature of the resource change taking place. This implies that generalised packages of ANFNE may not be much use, but that detailed planning must take place with the people who will receive the education.

If 'successful' nutrition education must always be coincident, and preferably integrated, with other programmes or policies which are causing resource changes; if nutrition education as a single-factor intervention cannot ever succeed; then how can its impact ever be satisfactorily evaluated, except in the rather sterile form of measured increases in 'knowledge'? To separate out the effects on nutritional status of each component of an integrated scheme is difficult and calls for sophisticated controlled trials. However, these can be done, and should be done if large amounts of resources are being put into nutrition interventions. Nutrition educators must accept that although knowledge is one of the resources which the poor should have, it is one among many. They can only be effective if their work of increasing knowledge is teamed with that of others who are working on other resources.

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2.4 Ways of Improving the Effectiveness of Nutrition Education in Developing Countries

by

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For the past four years I have been in a unique position. I have been the director of a project in international nutrition education - the International Nutrition Communication Service (INCS). This project has provided technical assistance and support to nutrition education efforts in twenty-seven developing countries. Thus I have seen a lot of what is going on and can report to you today that there is both reason to hope and reason to take alarm.

The good news is that the state of the art of nutrition education is vastly improved from what it was ten, even five years ago. When we used to talk about nutrition education, we had an image of an elderly nutritionist, tottering under the hot sun, delivering a long-winded lecture to a few somnolent souls on the various virtues of the four food groups. This no longer exists in most places.

Now when we talk about nutrition education, we should rightly be talking about a new, creative, changing discipline, whose roots are only partly based in nutrition; whose real source of inspiration comes from fields such as anthropology, market research, and even modern commercial advertising. It has a whole new vocabulary that includes such terms as message design, materials development, concept testing, media planning, tracking studies - all perhaps sounding on the surface like communications gobbledygook: but in reality, when taken in total, an array of extraordinarily interesting and effective techniques for changing dietary behaviour, and ultimately, if done well, for changing nutritional status as well. The new nutrition education begins by asking what is the nutrition problem to be solved? It begins by going to the community to find out if the problem is really what programme planners think it is, or whether it is something different. Is it a breastfeeding problem or a maternal nutrition problem or a diarrhoeal disease problem, or all three? Which one is more important? Once having established what the problem priorities are, (and they differ from situation to situation), the next question to be asked is whether that problem can be solved using a communications strategy.

Communications, for example, cannot bring potable water into villages, but it can help to change the age at which mothers wean their infants. The new nutrition education begins by identifying the individual behaviours related to the problem that need to be changed by the target group, and then gets inside the body and soul of that target group to find the roadblocks that prevent them from changing behaviour. What are the causes for a mother believing that she has insufficient milk to breastfeed? Is it because her doctor has not told her that 'breast is best', to use a well-known but overly general nutrition education message: that her sisters and aunts and other members of her extended family who used to be there to support her, are no longer around? Or is she being influenced by radio advertisements that tell her to go out and spend what little money she has on a breastmilk substitute?

Once having pinpointed a target community's 'resistance points' to change, the new nutrition educator will then ask that community to help him develop practical solutions that will overcome the resistance. These solutions, for example, the development of a new locally based weaning food mix, need to be tested out, both for their nutritional soundness and for their acceptance and 'doability' by the community. In Indonesia, for example, it was found that the reason why mothers said they had insufficient milk was that they were breastfeeding with only one breast, which they believed contained milk, while the other was believed to contain water: nutrition educators on the scene very quickly dispelled that notion, and the mothers were quick to see that it did not make sense and to change their practices.

Once new, nutritionally sound, 'doable' and acceptable behaviours are identified, messages then need to be developed to motivate people to adopt the new behaviours. These messages need to be put into the form of culturally relevant materials, and transmitted through a medium that will reach people in need: the materials have to arrive on time, and should arrive in waves, consistently over time through multiple, reinforcing channels of communication ... a radio broadcast, a poster, a message uttered by a community health worker.

I am simplyfying the procedure, but I hope you can begin to see that the new nutrition education is a discipline that, in its own right, demands to be applied with the same rigour that one would apply to the establishment of a nutrition surveillance system or to the development of a fortified food distribution project.

Certainly, it has been the sound mangement of the implementation of a carefully thought-out nutrition communications strategy that has been responsible for some of modern nutrition education's most notable successes: in Indonesia, for example, where a Ministry of Health/World Bank Project (with technical support from the International Nutrition Communication Service (INCS) member-agency Manoff International) has succeeded in demonstrating that a well thought out nutrition education campaign, by itself, can improve the growth curves of a target group of malnourished children. Another case in point is Morocco, where a U.S.A.I.D. evaluation team found significant changes in the nutritional status of infants who had received supplementary food and the benefits of nutrition education (in contrast with a control group who had received food alone). And in Brazil, where a national breastfeeding promotion campaign, sponsored by the Ministry of Health and UNICEF, is succeeding, by increasing the incidence of breastfeeding, in reducing the incidence of diarrhoeal disease and child abandonment. Perhaps I should also add to this list Dr Devadas' project in India, which sounds as if it has certainly achieved some impressive results.

What these projects have in common is that they have all relied principally on education and communication techniques to solve nutrition problems. The reason to take alarm is that policy-makers and planners have not yet seen the light and the wisdom of transferring this rich base of project experience to other settings. Most nutrition education in developing countries is still only a project addendum: is still focussed on rather unsystematic one-on-one counselling of health worker to client. Not that there is anything terribly wrong with face-to-face education *per se*: it is just that putting inter-personal education within the context of a sound communication strategy has taught us that the impact of such one-on-one, face-to-face education can be greatly strengthened. So, for this Conference, I thought I would take the liberty of suggesting, on the basis of what our INCS project experience has been, and an awareness of recent developments in the state of the art, six ways in which the effectiveness of nutrition education in developing countries can be improved.

1) *There is a need for a more rigorous application of systematic communications planning on the part of those in charge of designing nutrition education projects*: From a communications perspective activities such as formal or non-formal education are all viable options for a communications strategy. As such, they can be considered alone or in tandem; each can be considered as a separate channel or medium of communication through which a nutrition education message can pass and it is a cardinal rule of communications planning that one should use as many media or channels of communications as possible to deliver a message. In a discussion of each of these specific activities, we tend to focus on the skills necessary to do them well. This is important, but equally important is the need to look at them from a communications planning perspective. For example, a discussion of the techniques of participatory non-formal education will enable us to gain an understanding of how to do

participatory non-formal nutrition education, but it will not usually focus on the strengths and limits of participatory techniques in changing dietary behaviour or when to employ these techniques from an overall communications planning perspective.

2) We need to make greater use of communications and media professionals in nutrition education projects: It has been my experience, by and large, with several notable exceptions, that people involved in nutrition do not make good communications experts. This is not meant to be a disparaging remark, for certainly the reverse is true. I do not know what the reason is: maybe it is because nutritionists are concerned with putting more calories into people, and communications experts believe that all the world's problems could be solved if people would only communicate better. I have come to the conclusion, however, after many years of trying to marry the two disciplines in the same individuals, that it is a near impossible task: and so the next best thing would seem to be to try to get both types in the same room working together. I would hope that there would be in conferences of this kind in the future perhaps a greater inclusion of media people, of broadcasters, advertisers, market researchers, to whom people in nutrition ought to be talking quite frequently.

3) The need to articulate and promote workable communications methodologies for nutrition education: I think that the most pressing task facing the field of nutrition education today is the task of teaching nutrition education. It is not the task of teaching of nutrition per se that is important right now, though we all are well aware of improvements that could be made in that direction; rather it is the training of people in the skills necessary to plan, implement, and evaluate a first-rate nutrition communications project. INCS is hard at work on this problem, but obviously we cannot solve it by ourselves. In the next year we hope to put out two additional publications as resource materials for the teaching of modern nutrition communications; the first is A Guide to Mass Media and Support Materials for Nutrition Education and the second a handbook entitled Using Communication Processes to Solve Nutrition Problems, designed as a nutrition education teaching tool for nutrition educators. The point to be made, though, is that the 'new improved look' of nutrition education that has been captured in projects such as those mentioned above in Indonesia and Brazil, needs to be promoted, and that the skills to do tham need to be passed on to others.

4) We need to see a greater investment on the part of the decision-makers in large-scale nutrition communications projects. The three projects that I mentioned at the outset of this paper are, believe it or not, relatively small by the standards of international development. The Indonesian Ministry of Health/World Bank nutrition education project cost roughly one million dollars spread over five years - a figure that includes costs for all kinds of vehicles, structural equipment and participant training in foreign countries. It represented 10% of the total cost of a large World Bank nutrition loan to Indonesia. Preliminary figures from the Brazilian breastfeeding project indicate that UNICEF spent $375,000 over a three-year period, but that project was aided considerably by pro bono media-time contributed by the major broadcasters (something that you do not always get if you are doing a mass-media project). In comparison, a recent World Bank Family Planning Project to the same area is budgeted at $23 million over a five-year period. Given the fact that we now know that

nutrition education works on a large scale when done well, and that it is cost-effective, we, as nutritionists and educators and nutrition educators, need to do a more effective job of promoting the accomplishments in our field, and in getting governments to make a more serious commitment to the education side of the nutrition education equation.

5) A need to assess more systematically small-scale, informal nutrition education activities. While the world currently is suffering from an absence of large-scale nutrition communication projects, there is an abundance of what I would call traditional nutrition education going on in the informal sector by face-to-face counselling and promotion. This would include much of what I see this conference is going to discuss - activities such as primary health care workers who have nutrition education responsibilities, agriculturalists dealing with home and community gardens, primary and secondary school teachers and teacher trainers in nutrition. To my knowledge, no one has yet systematically assessed the impact that this kind of traditional one-to-one nutrition education is having, or how it can be strengthened. If someone does get up the courage to do this, I urge them to note that I used the word 'assess' rather than evaluate - because I fear that a full-scale evaluation effort might be disproportionate to the nature of the activity in the informal sector, and might frighten away those few brave souls who are actually out there trying to do something.

The INCS project has published a Nutrition Training Manual Catalogue that reviews 116 training manuals in nutrition many of them intended for use by field workers in developing countries. In our review of these manuals, we could find no evidence as to what extent any of them were being used in the field. If they are not, that raises the interesting question of what kind of support materials are nutrition field workers using? What kinds of materials do they need to have?

6) The need to develop more universal tools for nutrition education. Most good communicators will tell you that it is next to impossible to develop a universally applicable nutrition education material; and, by and large, I would agree with them. In the final analysis, most nutrition education materials need to be country-, culture- and community-specific. However, I do believe it is possible to develop certain universal tools that nutrition educators can use in local situations, modifying them where appropriate, of course. I want to distinguish here between a tool and a material, the difference, (at least, in my mind), being that a tool is a material that comes pre-packaged, so to speak, with an educational concept inside of it. A material, such as a poster, is something that must be developed from scratch. For example, a lot of work has recently been done in a number of countries to develop growth charts with specific educational messages that mothers can take home and use, both as a guide to their child's progress and as an aid in reminding them of what to do if the child fails to gain weight. David Morley's Child-to-Child Newsletter is both a tool in itself, and also a reference to other tools that can be used by children, their parents, or the community at large, to promote improved nutrition behaviour. We need to develop, pre-test and disseminate more such tools, so that we have more effective vehicles for transmitting nutrition messages to those in need.

I realise I have covered a lot of ground and for many of you, who may not be familiar with the INCS project, or what I am calling the new nutrition education, I am probably putting the cart before the horse. My goal is to instil in you a sense of the potential power of modern community-based communications to change for the better the dietary beliefs and practices and nutritional status of low-income people; to argue that nutrition education should be considered as a major option for decision-makers that now has at least as much credibility as its illustrious 'high tech' compatriots, such as food fortification, supplementary feeding schemes, food subsidy or pricing policies. Many, not all, nutrition problems are, in essence, problems of getting increased knowledge to people, and of motivating them to change behaviour. Until recently few have known what to do about it. I am delighted to report today that that situation is beginning to change. It is up to people such as yourselves to keep the momentum going.

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2.5 Food and Nutrition Problems and their Solution

by

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I would like to present the background to and the results of the communications and research project that I carried out with Wenche Barth Eide at the Institute for Nutrition Research in the University of Oslo. In the light of some of the working documents in the Unesco Nutrition Education series, I feel that this paper is relevant to some of the issues concerning the future of nutrition education. It presents a global reconsideration of the scope and objectives of education about food and nutrition problems and their solution.

The project that this paper presents was originally conceived in order to make use of the momentum created through the preparation and dissemination of the workshop report 'Who is Ignorant' which deals with the question of 'Rethinking Food and Nutrition Education Under Changing Socio-economic Conditions'.[1] In 1978 a workshop was held in Dar es Salaam under the auspices of the International Union of Nutritional Sciences. The workshop report was discussed during the XI International Congress of Nutrition in Rio de Janeiro the same year and subsequently diffused through publications and abstracts in various journals. Several people commented that the ideas represented innovative thinking concerning the goals and scope of nutrition education. This pointed to the need for a more systematic follow-up of the impact of the report. In 1981 the United Nations University's World Hunger Programme funded an international study to assess the reaction among nutrition orientated professionals to the ideas which emerged from the Dar es Salaam workshop. Additional funds were provided by the Norwegian National Nutrition Council and some contribution came from the Institute for Nutrition Research.

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[1] The process of rethinking food and nutrition education was initiated during the previous Congress on Nutrition Education in Oxford as a result of informal meetings to discuss the pedagogical methods of Paulo Freire. These ideas were discussed in a workshop during the XII International Nutrition Congress in Sandiego, 1981.

The question that is central to nutritionists involved in rethinking nutrition education is: How can nutrition educators respond to the challenges of today's world with respect to increasing hunger and malnutrition? The point of departure is that nutrition education in the past has been perceived by most people as information about nutrients in food, how nutrients affect growth, bodily development and function, and how food choices can be made to satisfy the best balance of nutrient intake according to need. Today, however, freewill plays a minor role in people's choices. In many developing countries there may be direct or indirect deprivation of total food intake. In modern technological society there is a continuous change in the nature of the food to which people have access. A new role for nutrition education might be to deal with why nutritional needs are not satisfied for everybody and what it would take to satisfy them in different situations. Such an approach must encompass an understanding of the social and economic factors and processes that determine people's access to food and nutrients. The new rationale is that: if people's access to food and a desirable nutrient composition is interfered with, it is useless to tell them how they ought to eat.

In the case of affluent societies where almost all food is commercialized, food products are often highly refined with numerous alien substances added for non-nutritional appearance, taste, shelf-life and profit. Here, therefore, nutrition education must first and foremost confront the forces that influence not only actual nutrient intake, but also people's food preferences - preferences often based on new, but sometimes false, 'values' imposed through clever marketing.

While there is definitely a relationship between the current food supplies of the poor and oppressed, and that of the affluent, the Dar es Salaam workshop report focussed on the situation in developing countries. In essence, it should be stated that a precondition for good nutrition for all is an even distribution of food resources and the popular control over these resources. Where policies of the state are consistently directed towards redistribution, nutrition education can centre around teaching people how best to use the resources available to them. On the other hand, where economic and social policies are explicitly or implicitly directed to maintaining an economically stratified society, nutrition education will, per definition, be more complex. Here there is a need to raise awareness - at all levels - of the possibility that such policies may contribute to promoting inequality and malnutrition.

International Follow-up Survey

It was in the above perspective that the Dar es Salaam follow-up project[2] was undertaken. Its principal component was an international survey to explore to what extent a number of professionals around the globe share or reject certain perspectives regarding the role and nature of nutrition education in today's changing world. Agreement over certain fundamental aspects (among at least part of the world's nutrition orientated professionals), would facilitate efforts towards clarification of a number of issues relevant to a 'new' nutrition education: What messages to formulate, to be conveyed to whom, and by what means. The overall goal is to stimulate professionals the world over to elaborate new directives for effective food and nutrition action. A national component of this follow-up project consisted of field testing of the Dar es Salaam ideas, which was carried out by the Tanzanian Food and Nutrition Centre.

The specific objectives of the survey were:

1) To obtain an indication of attitudes of food and nutrition orientated professionals concerning the need to make nutrition education relevant to prevailing socio-economic conditions.
2) To obtain a sample of projects and activities being undertaken which are considered to be a satisfactory approach to nutrition education.
3) To assess the impact of the Dar es Salaam report as such, that is, the value of the workshop, the influence it may have had on professional thinking, the feasibility and applicability of the outlined approaches.

The respondents to the IUNS survey who constitute our limited sample of nutrition educators-at-large, are generally aware of a need to expand nutrition education, but are not certain about the correct direction such an expansion should take. Nor is there a consensus about what action strategies to advocate. It appears that often nutritionists and nutrition educators are either lacking awareness of, or ignoring their role in, perpetuating 'the system' with its injustices and inequalities. This can often be coupled with an absence of a desire to review their endeavours in a professional context. Such evaluation might point out gross discrepancies between stated goals and everyday practice. There is practically no mention by the survey respondents of efforts to evaluate their projects. Where there was such evaluation the judgemental criteria employed are questionable. Also, there was hardly any mention of obstacles or constraints to appropriate nutrition education action.

The 'Who is Ignorant' philosophy of the Dar es Salaam report presents a challenge to the nutrition educator. With his or her actions and work context now being labelled social-economic and political, a profound process of reflection and rethinking is called for. Indeed, a rejection of this process may explain part of the non-responses to the questionnaire.

The results of the IUNS nutrition education survey, coupled with several recent papers in the same field provide an indication of what appears to be a turning point in the profession. Thanks to the communication explosion, more and more people are becoming knowledgeable about the true food and nutrition problem. We can safely say that the majority are, at least to some degree, aware but have not yet formalised and internalized this awareness. Also, most have as yet to conceptualize the means to implement the ideas. Since the target groups have always been thought to be at the local level, other more comprehensive educational strategy and new pedagogical skills may be called for in the future. Quite different messages (as well as media) will be needed for use with target groups at powerful levels in the decision-making hierarchy.

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[2] The editors regret that for reasons of space, it has not been possible to include the author's detailed account of the survey sample, nor of the sampling procedure that was employed.

A new food and nutrition perspective is imperative since evaluations of past efforts in this field show that much conventional nutrition education has not only proved to be ineffective, but sometimes harmful. Being effective may sometimes mean dealing with basic causes of malnutrition, which only far-reaching structural changes may alter. As a minimum, we may say that a nutrition education that does not concretely promote basic change in the direction of an improved nutrition and food situation could be considered to play a role in reproducing the causes of malnutrition.

An alternative orientation for nutrition education

The Dar es Salaam ideas advocate a broadening of the scope of nutrition education (meaning nutrition plus food education) in order to favour the necessary conceptual analysis as a base for launching effective action. Obviously, such work cannot be monosectorial nor can it be carried out within rigid disciplinary boundaries. Consequently the professional nutrition educator, analyst, activist role will have to be conceptualized along more interdisciplinary lines.

An evolution of the concept of nutrition education towards a more pragmatic and holistic orientation has been hampered by its origin in and loyalty to the natural biomedical sciences. Attempts to conceive nutrition education as dealing with other than the natural, physical, and technical aspects of nutrition have been termed as unscientific and unprofessional. However, as a result of the re-thinking process, it has been proposed that nutrition education should not be considered only as a profession or even as a specific occupation per se, but rather as an endeavour entered into by those who are actively concerned with spreading information about food and nutrition. This implies that all who seriously want to confront malnutrition should take on the role of a nutrition and food educator. Thus, those whose training has been principally focussed on nutrition and food education should spread their awareness to other related professions.

Tantamount to re-thinking food and nutrition education is a re-conceptualization of the term 'nutrition'. It should be mentioned that in many places the conventional definition of 'nutrition' is still quite a new concept in its own right. In such cases it might often be easier to promote, from the start, a holistically orientated food and nutrition education which would treat the basic causal factors of a nutrition situation and forego trying to establish a biochemical knowledge base as if it were a prerequisite. This implies a wider perspective from the outset, encompassing a recognition of structures, for example, social, economic, administrative and institutional.

The Dar es Salaam follow-up survey indicatd an agreement, among the majority of professionals, that nutrition education should include more multi-level programmes and community organization endeavours concerning social, economic, and food conditions. We would like to think of the analyst/educator role as that of a liaison and communications facilitator amongst government circles, academic disciplines, community sectors, and politics. The educator's contribution would be based on his or her enlightened perspective concerning the food system and sub-systems, and the implicit norms of each. Without such a perspective one will not be able to ascertain whose interests are being promoted in food policy decisions and practices. In identifying these interests, many people must co-operate with their speciality and knowledge of each part of the food system(s). An information communication strategy to enable the above guidelines to be put into operation would be to carry out, on a local, national, or regional scale, workshops and similar follow-up surveys. This would aid in opening up lines of communication and promote unified action amongst the different sectors and entities concerned. Such communication projects would constitute the first step in local action research programmes aimed at finding ways and means to further appropriate development of food and nutrition education.

Summary and Conclusion

The international survey obtained responses from 335 individuals concerning a reorientation of nutrition education. The majority believed that nutrition education should be broadened to encompass more than information about nutrients, diet and health. That does not necessarily mean that they have grasped or agree with the ideas contained in the Dar es Salaam workshop report (which was enclosed with the questionnaire) concerning scope, content and target groups relevant to a 'rethinking of food and nutrition education under changing socio-economic conditions'. A broadened nutrition education raises the issues of a broader range of target groups. When requested to select the most important among a number of proposed targets for communication of knowledge beyond consumers in general, about half of the survey sample tended to emphasize the need to reach key decision makers whose activities may have consequences for the food and nutrition situation of larger groups of people. Although many responded to the request for innovative approaches to nutrition education, most of the material obtained does not really pertain to a broadened 're-thinking of food and nutrition education'.

The respondents were divided into two categories: 1) a group which gave indication that they recognized social and economic processes as major or co-determinants of people's access to food and nutrients (58% of the survey sample). 2) those who reflected an orientation towards purely technical explanations and solutions to malnutrition (34% of the survey sample). The two types of orientations were clearly associated with the way people responded to the survey questions in general. The analysis indicated that the influence of the respondents' general characteristics was not of great importance. There were not any strong statistical associations which could be considered abnormal or illogical. The Third World respondents tended to be slightly more 'in favour' of the Dar es Salaam ideas than the respondents from the First World.

Most respondents found the 'Dar es Salaam ideas' important and of present interest, while a small fraction (from both categories of 'orientation') did not find that they represented anything new. The overwhelming majority did consider activites such as the workshop and report relevant; Many recommended similar workshops in national or regional settings, and some indicated a need for a newsletter.

As another step in the process of 'rethinking food and nutrition education' it is felt that the principal reason for undertaking this survey was, for the most part, achieved. The objective was to gain insight into broad attitudes towards nutrition education in today's changing world among an international sample of nutrition or nutrition orientated professionals. Thus, we see the pressing need to promote new attitudes, norms and practices through a redefining of nutrition educator's areas of action. Undertaking the International Union of Nutritional Sciences (IUNS) nutrition education survey and diffusing the results through this paper is an effort towards this end.

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2.6 Nutrition Education - the work of the International Union of Nutritional Sciences

by

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The proposal to form the International Union of Nutritional Sciences (IUNS) was first discussed in July 1946 in London, where a meeting had been convened by the British Nutrition Society. Two years later, a meeting of an International Provisional Committee was held. Statutes and bylaws were discussed, and the principal objects of the Union were defined as: a) the exchange of information, b) the organization of international congresses, c) the publication of the results of scientific investigation.

Since then the Union has grown steadily. At first the holding of the congresses was its main task, and international congresses have been held in cities throughout the world. The numbers attending have risen from twenty-two people, from thirteen countries in 1946 to over 3,000, from 92 countries in 1978. The XIII International Congress of Nutrition will be held in Brighton (UK) 18-23 August 1985. In 1968 IUNS was elected to membership of the International Council of Scientific Unions (ICSU). This was an important step in the history of IUNS.

The objects of IUNS are:

- to promote international cooperation in the scientific study of nutrition and its application;
- to encourage research and the exchange of scientific information in the nutritional sciences, by the holding of congresses and conferences, by publication, and by other suitable means;
- to establish such commissions, committees, and other bodies as may be required in the pursuit of (a) and (b);
- to provide a means of communication with other organizations, and to encourage participation in the activities of the International Council of Scientific Unions, of which the Union is a member;
- to develop activity regarded as helpful and appropriate in achieving the objectives of the Union.

There are no individual members of IUNS. Members are national bodies and a country 'adheres' to IUNS through a principal Academy, or National Research Council, or other appropriate scientific group.

IUNS Activities in Education

At the General Assembly of IUNS in Hamburg in 1966 an IUNS Commission was established on nutrition education and the seventh International Congress of Nutrition included a symposium on education. Before then IUNS concentrated on the scientific problems of nutrition. The reports at the VII Congress on 'Improvement of the nutrition situation by measures of education and training: experiences in various countries' came from India, Indonesia, Israel, Italy and Venezuela; the first (Bavly, 1966) listed the essentials for planning a nutrition education programme: determination of food consumption, and its nutritional value, by different groups in the community; study of traditional food habits; planning of the means of conveying information; evaluation of the effectiveness of the programme, and 'as a last step, a cooperative study by all concerned... to investigate the cause of weakness of certain channels of nutrition education and to recommend desirable changes in the approach'. Such steps still apply.

The IXth International Congress included a symposium on nutrition education programmes around the world. The paper from France (de Garine, 1975) was the first example of discussion by an ethnologist at an international nutrition congress on the problems of educating people to change their food habits. The programme of the Xth International Congress of Nutrition in Kyoto in 1975 included a surprisingly popular symposium on nutrition education and training and a well attended session of 22 free communications from all continents on subjects ranging from the use of games in nutrition education to teaching methodology for university professors. The papers and discussion made it clear that at that time (1975) many professional groups agreed that: nutrition education is important and should be given increased emphasis in the training of all health care practitioners; education that will reach and affect the behaviour and wellbeing of larger segments of world population is urgently required; professional practitioners of many types ought to incorporate sound nutrition concepts into their practice; and applied nutritionists should occupy a more prominent place in the team of health care practitioners. The passage of time since these conclusions were reached has not weakened their validity.

In 1966, IUNS set up commissions on the major aspects of nutrition, with related committees. Commission V on Nutrition Education and Training was concerned with the training of professional groups who can apply their knowledge of nutrition in their jobs: there were committees on schools of medicine; agriculture; food science and technology; home economics and dietetics; public health; dentistry; veterinary sciences, and on graduate degrees in nutrition. Later, pharmacy, nursing and clinical nutrition were added to the professional groups, and a committee was started on nutrition education of the public. IUNS has not studied nutrition education for school children.

Food Science and Technology

The first committee to publish a report (IUNS, 1969a) was that on food science and technology. Its purpose was to provide guidelines on the scope and extent of nutrition education needed in academic courses leading to first and higher degrees. The report discussed background academic developments, the role of food science and technology in society, the curricula for first and higher degrees and it included the recommendation that 'All curricula should include at least one course in basic nutrition. Such a course should emphasize the importance of food and other factors to the consumer.'

A second report of the committee was produced in 1981 (IUNS, 1981b, unpublished). In this report the committee reviewed education in food science and technology throughout the world and stated that the principal recommendation in their first report that all curricula should include at least one course in basic nutrition was generally met and often exceeded by universities. Usually a 30 to 45 hour course was given in the third or fourth year of a 4 year programme. The committee recommended that the time allotted to nutrition should be about doubled to allow for basic nutrition in the third year and also applied nutrition in the fourth year for which they recommended the following curriculum:

- Nutritional aspects of food manufacture: nutrition as a quality factor. Nutrient fortification. Effect of processing, packing and storage on nutritional quality. Nutritional information to consumers.
- Elements of dietetics: Food planning. Socioeconomic factors in food selection. Mass or institutional feeding. Dietetic foods.
- Elements of food toxicology: Toxicology of natural constituents, contaminants and additives. Evaluation of food safety.
- Malnutrition, health problems connected with nutrition: Malnutrition in the world. Nutritional problems in the country or region. Causes, symptoms and control of nutritional diseases. Food resources.

The committee commented that, while there is no shortage of good textbooks for teaching nutrition to undergraduates, these books are usually expensive, available in only one language and written for both the professional and the student. They saw the need for a standard book for use in undergraduate courses in both basic and applied nutrition. The committee also considered that in advanced courses the practical aspects and global significance of nutrition should be stressed.

Agriculture and Veterinary Science

Two reports, the first on veterinary science (IUNS, 1969b, unpublished) and the second (Bacigalupo, 1978) on human nutrition training for agricultural students, stress that agriculturalists and veterinarians should understand the problems of human nutrition. Bacigalupo set out a scheme which resembles that advocated for food scientists and technologists but included, additionally, sections on: the role of agriculture in human society; food economics; human nutrition considerations in food production and supply planning and other aspects of agriculture; and the role of food crops in socioeconomic development and planning. He also mentioned the need for appropriate textbooks.

The Health Professions

The first report on medical faculties (IUNS, 1971) concluded that, although there were developments intended to improve education in nutrition for the medical profession in some countries, the situation in most schools of medicine was not satisfactory. The committee recommended that the physiological and biochemical basis of nutrition be taught in the preclinical years, and the pathology and therapy of nutritionally induced disease in the clinical years; that the public health and community medicine aspect of nutrition should be an integral component of the medical curriculum, and that clinical nutrition and preventive or therapeutic dietetics should be taught in such a manner that the medical student is able to make use of this knowledge in medical practice. They also made recommendations about postgraduate education and suggested that the best and most effective way of achieving integrated and full teaching courses in nutrition in medical schools would be for such courses to be led by an individual holding a chair of nutrition in the school. A later chairman of this committee has reviewed (Dutra de Oliveira, 1976) the teaching of nutrition in medical schools and has also concluded that nutrition is inadequately taught. He thought that one of the obstacles to proper teaching to medical students is the multidisciplinary nature of nutrition and recommended that nutrition should be clearly indicated in the curriculum as an independent medical speciality.

Later the committees on schools of medicine, pharmacy and dentistry were combined and the new committee made a detailed survey through its members in Africa, Asia, Europe, North America and Latin America. Their recommendations (IUNS, 1979) are that long term plans should be devoted to actions that:

> Change the attitudes toward, and the knowledge of, nutrition among the health professionals with whom the medical, dental and pharmacy students come into contact during their studies; stimulate the practical application of scientifically based nutritional principles within the environment of the students (eg nurses and kitchen staff); encourage public debate so that it will promote the development of healthy habits; stimulate increased scientific research, in cooperation with clinicians, on the relationship between diet and disease and the possibilities of preventing, alleviating, and curing diseases with the aid of diet; deal with measures required to make curricula applicable to the students' everyday lives as physicians, dentists or pharmacists; encourage nutrition scientists to disseminate their knowledge to laymen in simple but correct terms, not only through personal contact, but through the mass media.

Because of the potential value of nurses in teaching nutrition to the general public, the IUNS committee on nursing has reviewed the state of nutrition education for nurses in more than 20 countries and has made recommendations for improvements with detailed guidance on the syllabus, methods of teaching, and training of the nurse educators. The committee has suggested that: 60 hours should be the minimum amount of time devoted to instruction in nutrition; basic nutrition should be taught during the first year of nurse training; the practical application of nutrition should be substantially increased and integrated throughout training; more teaching aids should be available, including up-to-date nutrition text books and nutritional material published in government institutions about combating malnutrition (IUNS, 1973b). The most recent report (Jelliffe, 1981) contains lists of books and other references for both instructors and students.

The first report of the committee on nutrition education and training in schools of home economics, nutrition, dietetics and allied health professions (IUNS, 1972; 1973a; Hollingsworth, 1974) described the training of dietitians and public health nutritionists in 46 countries in all the WHO regions. The characterisitcs most frequently found were that the training lasted 4 to 4½ years and usually included a bachelor's degree from a university or equivalent technical institute and about one year of practical experience in some recognised and suitable work. A number of countries saw the need to train dietitians for service in the community as well as in hospitals, and for preventive as well as therapeutic nutritional care. There was a general recognition of the shortage of qualified personnel relative to demand.

During the XI International Congress of Nutrition in Rio de Janeiro in 1978 a workshop was held to review the whole subject of nutrition education for medical and other health sciences. Its conclusions (IUNS, 1978 unpublished) summarize many of the findings of the individual committees and include the following statements about nutrition education:

- Concepts relating health to preventive medicine must be evolved having in mind the cultural context of each community or country.
- A relevant body of knowlege must be developed and implemented showing the interrelationships between biochemistry, physiology, dietetics and food technology as well as the clinical aspects of nutrition and medical problems such as obesity and atherosclerosis, and, more especially in the Third World, protein-energy malnutrition and vitamin and mineral deficiencies.
- Skills must be developed for the application of the above body of knowledge, ie the how to do it aspects of nutrition, at all levels of health services and sciences.
- Attitudes must be developed towards the socioeconomic and political factors concerned in relating nutrition to governments, educational institutions and others who represent the power structure and the decision makers relevant to the allocation of money.

Graduate Degrees in Nutrition

In the first report (IUNS, 1974) of the committee on graduate degrees an attempt was made to define the meaning of the term 'nutritionist', and the point was made that most of the world's nutritional scientists trained originally in one or more disciplines other than nutrition, but that for the future more specialist training and research experience is needed. The committee recommended that the following areas of knowledge should be covered in lecture and laboratory courses in graduate nutrition degree programmes:

General - to include history of nutritional sciences and world food and nutrition problems.
Experimental nutrition - to cover topics such as the chemical and biochemical aspects of carbohydrates, lipids, protein, vitamins, minerals, water, and energy metabolism as related to nutrition; metabolism and fate of each essential nutrient; deficiency signs in animals and man and nutrient requirements; digestion and absorption of nutrients; appetite and hunger; nutritional interrelationships.
Applied nutrition - to include evaluation of nutritional status and methods of nutrition surveys - food intake studies; obesity and diseases associated with overnutrition; infectious diseases and nutrition; nutrition education methods; cultural, behavioural, physiological, social, and economic factors affecting food habits and food intakes, school feeding programmes, meal preparation.
Food and nutrition relationship for example food and feed composition (and use of composition tables); food microbiology and sanitation (as related to nutrition); food additives, enrichment of food with nutrients; food legislation and regulations.

Education of the Public

A workshop, arranged by W Barth Eide, was held in 1978 in Tanzania with some 40 participants and observers from many parts of the world. The aim of the workshop was to broaden the vision of nutrition educators to an awareness of their potentially important role in the development of policies that can lead to real improvements in the food supply and the nutritional condition of people in various societies. The report of this workshop (Eide, 1978) stresses the need for nutrition educators to be alert to the nature of economic constraints. Its conclusions and general recommendations are:

'1. Nutrition education must be alert to the nature of the constraints on various policies generated by international economic systems (eg the New International Economic Order) as well as on the proposed 'Basic Needs Approach' to development strategy.

'2. Nutrition and nutrition education have too heavily concentrated on the side of individual consumption and its physiological effects. Nutrition education must clearly emphasize that malnutrition is the result of maldistribution of the means for food production, storage and distribution, and by inequality in control over the access to food. The concept of nutrition must therefore be broadened to include these factors.

'3. Socio-economic structure determines the role of the nutrition educator. In situations in which programs and policies are directed towards erasing economic and social inequality the nutrition educator can employ commonly accepted methods while working through formal channels like schools, mass media and political institutions, and informal channels such as special interest and community groups. In situations where the government supports economic inequality, the nutrition educator must take care that his/her work is not used to deflect attention from what we recognize as the underlying causes of malnutrition, and may need to utilize less conventional methods to work in support of groups attempting to expose and tackle these causes at their root.

'4. In most cases it is not possible to reach a full consensus on what nutrition education should be if there is not a shared view on why malnutrition exists in a society. Nevertheless, a dialogue between holders of different views must be encouraged so that channels of communication remain open.

'5. In some societies the work of exposing the root causes of malnutrition may place the job or personal safety of the nutrition educator at risk. In those cases support and solidarity must be offered to such workers by their professional colleagues.'

Conclusion

One of the important points that has to be taken into account in devising modern guidelines about nutrition educational policy is that advice that is necessary where and when food is abundant may appear to those not learned in nutrition to contradict advice given when food is short. An important task for the modern nutrition educator is to unravel the apparent paradoxes for those who do not have complete understanding of the principles of nutrition. The principles of nutritional science do not change even if the amounts and nature of the foods available do.

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2.7 The Two Worlds of Nutrition Education: Similarities and differences between industrialized and developing countries

by

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A nutrition educator from California was upset when she heard an educator from India recommend adding more sugar to weaning foods. Her Indian friend was confused by references to a 'life cycle approach' and to 'informed choice'. Similarly motivated nutrition educators from industrialized and developing countries face a communications barrier when they share their professional concerns.

This paper is an attempt to demystify this barrier in order to facilitate future cooperation. Industrialized country examples are taken from the experience of the United States. The major areas of difference and similarity which will be examined in this paper are:

Thematic content
Goals
Specificity of behaviourial solutions
Methods of message design
Public sector channels and media
Role of the food industry

Thematic Content

The thematic content differs because of the nature of the major nutrition problems facing different countries. In developing countries the major problem is undernutrition. The overwhelming public health nutrition problem is high infant and young child mortality, and developmental disorders associated with insufficient energy and protein intake. There are also food sufficiency problems related to subsistence agriculture. The most common themes relating to health and child development concern:

- The special nutritional needs of vulnerable groups, including pregnant and lactating women, infants and growing children, and focusing on breastfeeding and weaning practices.
- Balanced diet, or functions of food groups.
- Feeding during illness, especially the need to rehydrate and nourish young children with diarrhoea.

Those relating to agriculture are:

- Household food cropping and purchasing patterns, with special regard to the adoption of new varieties and to the nutritional consequences of cash cropping.
- Consumption of nutritious foods produced with programme assistance.
- Backyard production and consumption of vegetables and other protective foods that are not the primary focus of the agricultural programme.
- Food storage and preparation, using appropriate local construction materials and fuel.

In industrialized countries, the major problem is overnutrition, or the consumption of too many calories, too high fat and salt intake and too little fibre. The following adaptation of US Dietary Goals (Hitt, 1982) provides a representative set of themes:

- Maintain ideal weight
- Increase the consumption of complex carbohydrates and naturally occurring sugars to about 50 per cent of total calories. (although recent work by Crapo and others call this advice into question (Kolata, 1983)).
- Reduce the consumption of refined and processed sugars, including alcohol, to about 10 per cent of total calories.
- Reduce overall fat consumption to about 30 per cent of total calories, and reduce saturated fat intake to account for no more than 10 per cent of total calories.
- Reduce cholesterol intake to a level of 300 mg or less a day.
- Limit the intake of sodium by consuming no more than 5 gms of salt a day.

Maternal-child nutrition themes in industrialized countries do not differ greatly from those in the developing world. Since pre-and postnatal growth monitoring and public knowledge of adequate infant feeding practices are widespread, the urgency of disseminating these is less important. Some countries, such as Tunisia, make use of both sets of themes at opposite ends of the socioeconomic spectrum. The better off experience heart disease, while the poor suffer from protein energy malnutrition (PEM). Breastfeeding promotion is common to both settings. These thematic differences lead to two types of misunderstanding. The first comes from directly contradictory dietary needs and messages:

industrialized	developing
less meat	more meat or animal protein
less fat or oil	more fat or oil
less sugar	more sugar (for nutrient density in weaning foods)
less preservatives	more preservatives
more fibre	less fibre

There are no real contradictions here. For example, industrialized populations consuming more than forty per cent of calories from fat need less; developing country populations receiving less than fifteen per cent need more.

A second source of misunderstanding arises from the relative severity of the health problems involved. Protein energy malnutrition associated with infection, kills and maims millions before the age of five. Overnutrition is much less lethal, rarely contributing to clinical disorders before the age of fifty.

Goals

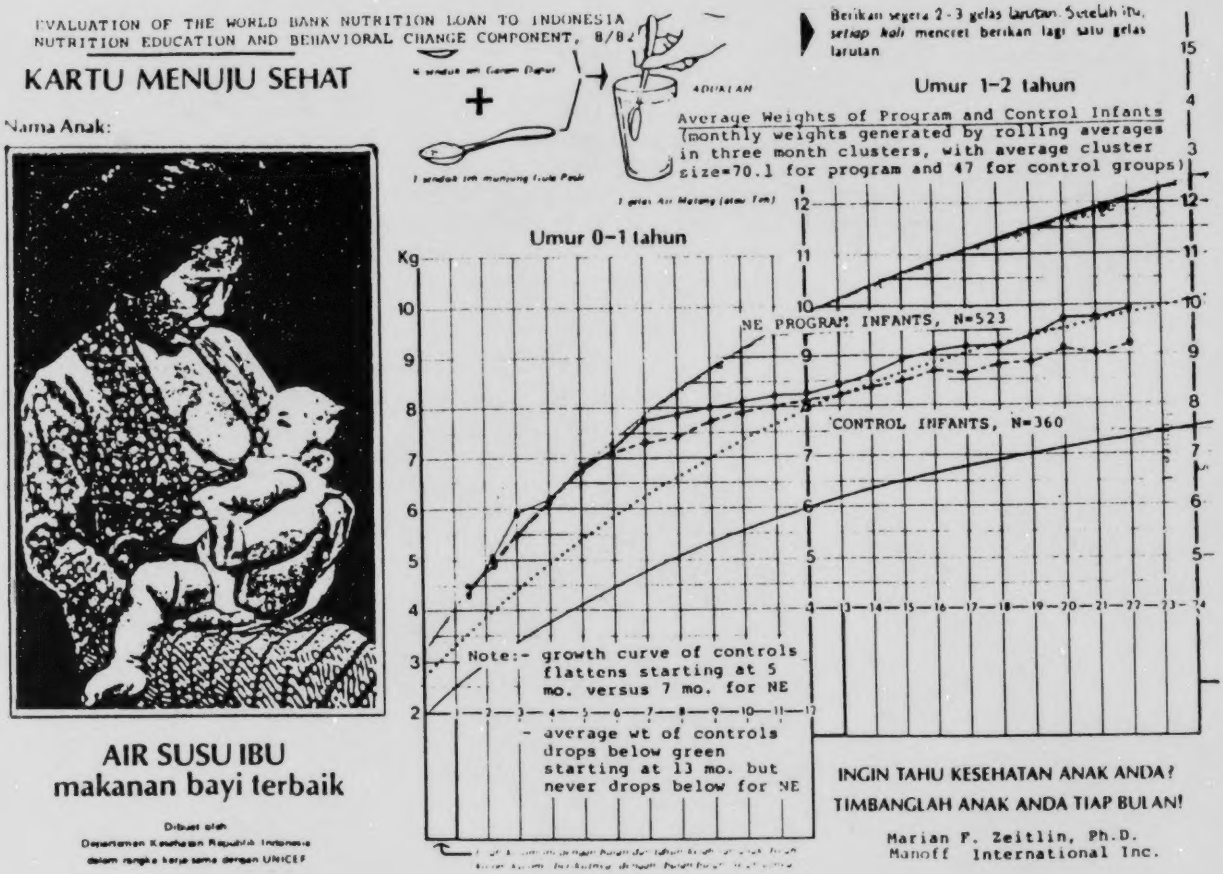
A major difference in goals arises from the severity of attendant health problems mentioned above. In developing countries the health risks of malnutrition are so high that behavioural change and improved physiological indicators of nutritional status, are the goals of nutrition education. Figure 1 from the evaluation of the Government of Indonesia, World Bank, and Manoff International Nutrition Education and Behaviour Change Project in Indonesia (Zeitlin et al, 1983) demonstrates that significant physiological changes can in fact be achieved by nutrition education alone without food supplementation. The difference shown between the project infants and comparison infants by the second half of the second year represents half a standard deviation in weight for age. This means that about forty per cent of children in the project group completed the weaning age with better growth status than those in the other group.

In the United States the situation is considerably more complicated. There is what may be described as a philosophical rift between the major funding sources that promote dietary change. The rift is between believers in behavioural change versus informed choice. Table 1 presents a profile of nutrition activities by funding source in the United States. Nutrition education is defined to include all forms of promoting 'healthful' dietary practices. The major funding agencies for nutrition education within government are the Agency for International Development (USAID), the Department of Agriculture (USDA), and the Department of Health and Human Services (HHS). The biggest funding source is the food industry. An irony is that the amount of money spent to promote good nutrition under the guise of risk reduction and food advertising is at least twenty times the amount spent in the name of nutrition education.

Those who call themselves nutrition educators within the United States tend to be funded by the Department of Agriculture. They adopt an approach in which the goal is to educate the consumer to make an informed choice. This group feels philosophically compelled to respect the freedom of the individual, they do not believe that nutritionists should attempt to control the behaviour of consumers. More than half of the USDA funds spent on nutrition go to support paraprofessional aides in the Expanded Food and Nutrition Education Program (EFNEP). These aides are similar to community level nutrition works in developing countries. They are neighbourhood women with high school or lower education who are paid a minimum wage to visit low income mothers in their homes. Unfortunately, the number of aides is insufficient to achieve wide population coverage.

National Institute of Health funds for cardiovascular risk reduction go to medical establishments and communications and education specialists. Nutrition is viewed as one part of the health education or communications component of these programmes. They may engage the services of a nutritionist to assist with the formulation of recipes and other technical nutrition content. Like developing country nutrition education programmes, their goal is to produce changes in behaviour and in nutritional status indicators. The medical, dietetic and communications professionals working in risk reduction define behavioural objectives that the food industry translates into new products and new consumer advertising.

Figure 1 The relationship between nutrition education and infant growth in Indonesia



EVALUATION OF THE WORLD BANK NUTRITION LOAN TO INDONESIA
NUTRITION EDUCATION AND BEHAVIORAL CHANGE COMPONENT, 8/82

Average Weights of Program and Control Infants
(monthly weights generated by rolling averages in three month clusters, with average cluster size=70.1 for program and 47 for control groups)

NE PROGRAM INFANTS, N=523

CONTROL INFANTS, N=360

Note:- growth curve of controls flattens starting at 5 mo. versus 7 mo. for NE
- average wt of controls drops below green starting at 13 mo. but never drops below for NE

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KARTU MENUJU SEHAT
Nama Anak:
AIR SUSU IBU
makanan bayi terbaik
Dibuat oleh
Departemen Kesehatan Republik Indonesia
dalam rangka kerja sama dengan UNICEF
Umur 0–1 tahun
Umur 1–2 tahun
Kg
2
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24
ADUKLAH
1 gelas Air Matang (atau Teh)
1 sendok teh munjung Gula Pasir
+
Berikan segera 2 - 3 gelas larutan. Setelah itu, setiap kali mencret berikan lagi satu gelas larutan
INGIN TAHU KESEHATAN ANAK ANDA?
TIMBANGLAH ANAK ANDA TIAP BULAN!

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Specificity of Behavioural Solutions

It is generally easier to develop specific behavioural solutions to nutrition problems in developing countries. This is because total food inventories are smaller and the populations at risk are economically constrained in their choices. When the daily diet of all high risk individuals contains only a few items it is relatively easy to develop and test simple messages that apply to everyone, eg for pregnant women: eat one more plate of rice every day.

Table 1 Profile of Nutrition Education Activities by Funding Source in the United States

	AID	USDA	HHS[2]	HHS (MEDICAID MEDICARE) Private Health Services	Food Industry
Term used for nutrition education activities	nutrition education	nutrition education	risk reduction	nutrition counseling weight control	food advertising
Stated Goals	behavior change/ nutritional status change	informed choice	behavior change/ improved risk	behavior change/ improved risk indicators	behavior change purchase of healthful foods
U.S. $/year[1] in millions	0.75	100	5 (for nutrition component only)	not estimated	2,000 (only for foods reducing risk of cardiovascular disease)
Target groups	developing country MCH	low income MCH	high risk adults, entire population	sick or high risk, MCH	high risk adults entire population
Role of nutrition professionals	significant	important	minimal	moderately important	minimal
Estimated impact on national dietary practices	high return on investment	low	high return on investment	high	very high

1 Approximate estimates by informed individuals
2 National Institutes of Health

From 1928 to 1979 the number of food products available in large supermarkets in the United States increased from 867 to about 12,000 (Molitor, 1980). Zeitlin and Amin, (1972) found just over 200 foods in Pakistan. A Dinka tribe in the Sudan had about 75 (Zeitlin, 1977) and a village in rural Bangladesh about 125 (Zeitlin and Rizvi, 1983). Obviously, the fewer foods commonly eaten, the easier it is to go from the abstract e.g. eat more vitamnin A, to the concrete theme level: eat more green and yellow vegetables and fruits, to the message level: eat spinach and papaya daily.

As an example of intermediate specificity, Hitt's (1982) translation of the US Dietary guidelines given earlier is:

- Increase consumption of fruits, vegetables and whole grains.
- Decrease consumption of refined and other processed sugars and foods high in such sugars.

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- Decrease consumption of foods high in total fat, particularly saturated fat, by reducing the portions consumed of these goods high in total fat and substituting lower fat alternatives such as lean meats, poultry or fish, or low-fat and non-fat dairy products
- Decrease consumption of foods high in cholesterol by reducing the portions consumed of those foods high in sodium content, and reduce the use of salt to season foods in the home, both in the kitchen and at the table.

Figure 2, isolates nutrition education target groups or learner groups according to two dimensions. The first dimension is on the X-axis and represents socioeconomic and environmental restrictions. It represents price, food availability, time and facilities for preparation, and literacy skills. Industrialised populations tend to fall at the low end of this scale, with many foods available and no economic restriction on choice. Developing country populations fall at the other extreme. The Y-axis represents level of short term to medium term health risks from malnutrition. A number of important distinctions can be made by fitting NE target groups into the four quadrants of this diagram.

Figure 2 Target Populations for Nutrition Education by Degrees of Socioeconomic Restriction and Short to Medium Term Health Risk

High

Quadrant 2 People with diet related degenerative and other diseases	Quadrant 3 Vulnerable age groups in poor communities
Quadrant 1 Well nourished, short to medium term health risk healthy, affluent people	Quadrant 4 Adult males and non child-bearing females in poor populations

Low Socioeconomic Restrictions High

- price
- food availability
- preparation time and facilities
- literary skills

Quadrant 1 Low in health risks and in socioeconomic restrictions, this group represent healthy well nourished individuals in affluent populations. An informed choice approach is appropriate here. Specificity can be achieved by teaching culturally interesting culinary practices. The food pages of the Sunday magazine apply, as do health, biology, and nutrition textbooks.

Quadrant 2 Low in economic restrictions, but high in nutrition related health risk factors and disorders. A wide variety of conditions affect this group including obesity, heart disease and diabetes. Although income is not a factor, advice to use specific foods and behavioural routines may be extremely helpful.

Quadrant 3 Low income pregnant mothers, infants and young children in developing countries are in the highest short term risk and the highest socioeconomic constraints category. In addition to greatly limited food resources, these groups may have cultural beliefs and practices which endanger nutrition and health status. Anaemia, low birthweight, and retarded growth and development are common. Mothers tend to be overworked and unable to make elaborate preparations for a single child. Carefully tested, highly specific behavioural solutions are essential. The degenerative disorders found in Quadrant 2 are less important among developing country populations because undernutrition offers some protection from them and because they cause a low percentage of total mortality.

Quadrant 4 Low in resources and low in immediate risks, adult men in developing countries and non childbearing women are prime target audiences for the agricultural themes, such as home gardening, food storage and appropriate technology. Most of these themes and messages benefit from careful development. Third World farmers tend to be experienced and efficient within their own technologies. Without major capital investments it may be hard to improve their methods.

Methods of Message Design and Materials Development

Nutrition education programmes in several developing countries have excelled in methods of message design. The earlier mentioned project in Indonesia (Griffiths et al, 1983) and oral rehydration projects in Honduras and the Gambia (Mayer et al., 1983) are good examples. Factors that contributed to high quality methodological performance included:

- The need for behavioural specificity of message content for vulnerable groups in poor communities.
- Low labour costs in developing countries relative to available project funds.
- Excellent community initiative and participation at the village level.
- Local developing country expertise in community motivation and development methods.

Until now few, if any, attempts to apply these methods have been made domestically in the United States. The Indonesian programme will be used here as an example. This project, which was directed by the Health Education Directorate of the Ministry of Health reached over 225,000 persons in 5 subdistricts in Java and South Sumaatera. The education programme centred around monthly weighing sessions, conducted by community volunteers called nutrition kaders. It included one-to-one counselling, group talks, home visits, posters, and radio, but did not distribute foods or provide primary health care. Table 2 shows the identified problems in the area and the comprehensive set of specific solutions that were developed to solve them.

Figure 3 depicts the method used to design the messages and materials. This method, called 'concept testing', is a variant of a more general communications approach commonly referred to as 'formative evaluation'. It adapts and incorporates food industry methods of testing procedures that accompany new products, such as cake mixes, for example.

Concept testing as shown in Figure 3 involves 12 steps. The odd numbered steps to the left were conducted primarily by the nutrition education team. The even numbered steps involved the community. The problems identified to the left of Table 1 became the topics of focus group discussions at village meetings (step 2). A health educator trained in community development and a nutritionist ran the meetings which were organised by village government (a large and highly structured set of governing bodies and subcommitteess in Javanese villages.)

During the group meetings, problems were specified and behavioural solutions were suggested and listed. These lists were synthesized in step 3 by the nutrition educators. At step 2 agreement also was reached that the villagers would participate in in-home trials when requested to do so by members of the nutrition education team. Step 4 represents these household trials. Team members used thigh circumference (Zeitlin et al., 1981) to identify malnourished infants under 2 years. They then worked in the homes of these infants to diagnose specific behavioural problems and to suggest solutions for trial. During the following week-long trial period, they returned to the homes to observe and discuss procedures with the mothers. Trials of this type, involving one or more nutrition problems per household, were conducted in more than 300 homes.

The extent to which in-home trials of specific behaviours, routines, or procedures can prove useful in risk reduction and nutrition education programmes in industrialised countries is unclear because:

- in-home trials have not been systematically attempted.
- it may not be appropriate to specify behaviour at the trial level, as noted earlier.

Yet this method may have great potential for people with diet related diseases (see figure 2) who have poor compliance records, for example renal patients on low protein diets.

The message and materials development model currently used by both behaviour change and informed choice oriented educators in the United States is represented by Figure 4. This diagram resembles Figure 3, except that the trial phase is missing and may be replaced by formative market research surveys conducted at regular intervals in long term ongoing projects such as the 10 year Stamford Five City heart disease project.

Public Sector Channels and Media

Most nutrition education goes on in association with health services in both industrialized and developing countries. An efficient format for education in high risk target groups (Figure 2) is individual counselling linked to regular monitoring of the physiological risk factors affecting the individual.

In the United States primary care nurses and physicians conduct most nutrition monitoring and counselling. Difficult cases are referred to the resident dietician/nutritionist, who is a specialist. In primary health care programmes in developing countries this order sometimes is reversed. Layworkers, who may be community volunteers, conduct growth monitoring and refer cases with health problems to the primary care worker. Or a family planning worker may monitor nutrition. Group education or behaviour change programmes are commonly organised by health services or other community agencies in both settings. Similarly agriculture ministries or departments commonly sponsor nutrition field workers.

Table 2: Nutritional problems and behavioural solutions in the Nutrition Education and Behavoural Change Project in Indonesia

PROBLEMS	NUTRITION EDUCATION MESSAGES
Pregnant Women:	
Undernutrition, Vitamin A	Each day eat four plates* of food, eat green vegetables four times and take an iron pill.
Lactating Women: Undernutrition, Vitamin A deficiency, anaemia, and insufficient fluid intake	Same as above, plus drink eight glasses of liquid per day.
Infants, 0-4 Months Poor lactation practices, premature introduction of solid foods	Breastfeed only and use both breasts at each feeding.
Infants, 5-8 Months: Insufficient supplementation which relies on rice porridge and other starches with poor caloric density.	Breastfeed, using both breasts. Feed bubur campur (enriched rice porridge) four times per day. Introduce this supplementary food patiently.
Infants, 9-24 Months: Protein calorie malnutrition and Vitamin A deficiency due to insufficient quantity and variety of foods.	Give the child adult food four times per day,including tabu, tempe or fish and green vegetables, offer snacks between meals. Continue breastfeeding until two years.
Children with Diarrhoea: Dehydration	Give the child LGG, an oral rehydration mixture made with one two-finger pinch of salt, a tablespoon of sugar, and a glass of water. Continue to give soft food and to breastfeed.
All Mothers of Children Under 5 Years Old Need for regular growth monitoring	Take the child for weighing every month. If the weight does not increase, the child is not healthy; seek advice and give the child more food. Ask your Kader, midwife, or the health center staff for nutritional advice.

*Message elements determined through concept testing are underlined.
Source: Zeitlin et al. 1983

Figure 3: Formative Evaluation - Concept Testing, Focussed on Behavioural Change

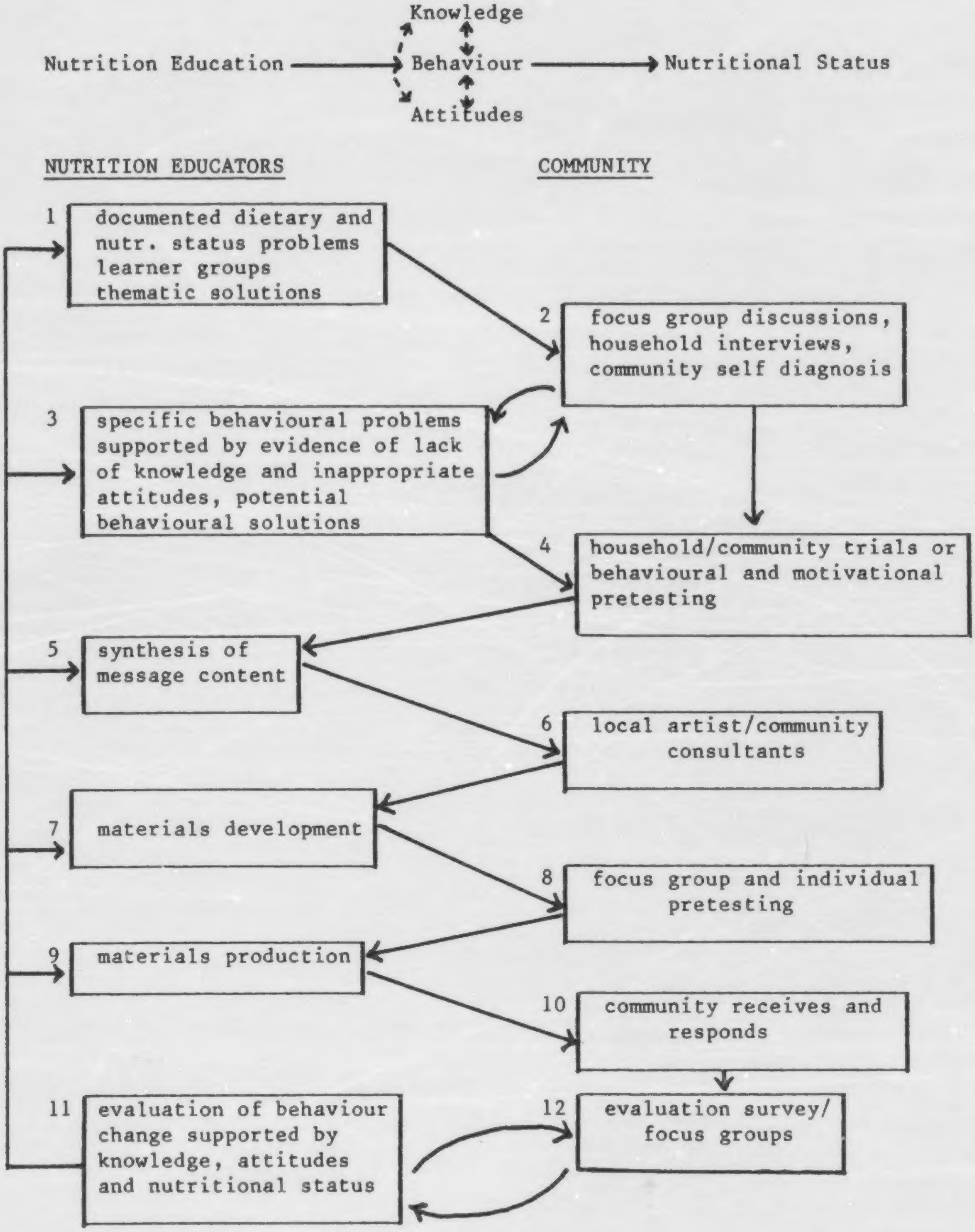
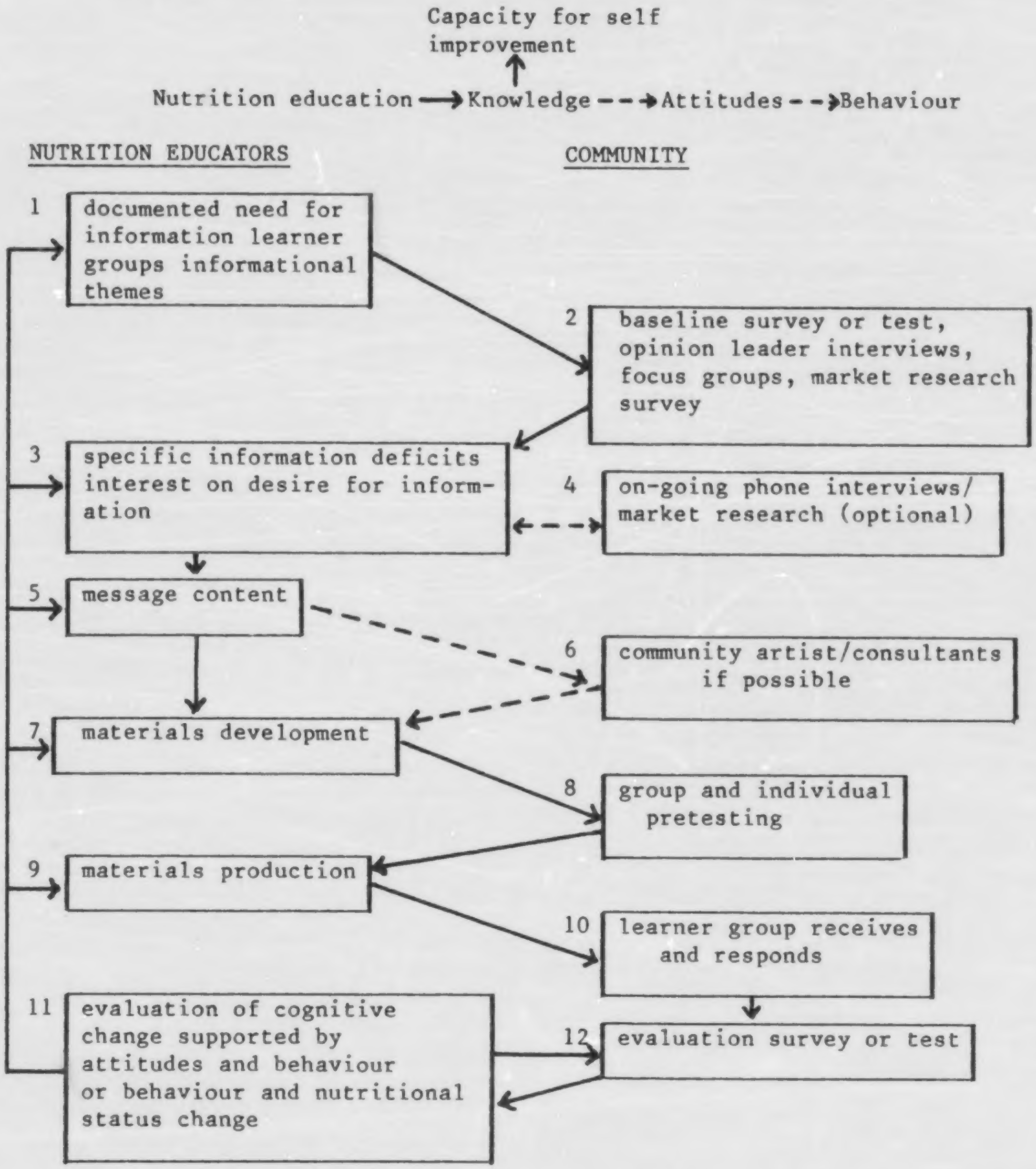

Knowledge
Nutrition Education
Behaviour
Nutritional Status
Attitudes
NUTRITION EDUCATORS
COMMUNITY
1
documented dietary and nutr. status problems learner groups thematic solutions
2
focus group discussions, household interviews, community self diagnosis
3
specific behavioural problems supported by evidence of lack of knowledge and inappropriate attitudes, potential behavioural solutions
4
household/community trials or behavioural and motivational pretesting
5
synthesis of message content
6
local artist/community consultants
7
materials development
8
focus group and individual pretesting
9
materials production
10
community receives and responds
11
evaluation of behaviour change supported by knowledge, attitudes and nutritional status
12
evaluation survey/ focus groups

Figure 4: Formative Evaluation without concept testing - Focus on Cognitive Change and Informed Choice


Capacity for self improvement
Nutrition education
Knowledge
Attitudes
Behaviour
NUTRITION EDUCATORS
COMMUNITY
1
documented need for information learner groups informational themes
2
baseline survey or test, opinion leader interviews, focus groups, market research survey
3
specific information deficits interest on desire for information
4
on-going phone interviews/ market research (optional)
5
message content
6
community artist/consultants if possible
7
materials development
8
group and individual pretesting
9
materials production
10
learner group receives and responds
11
evaluation of cognitive change supported by attitudes and behaviour or behaviour and nutritional status change
12
evaluation survey or test

Within the school system, nutrition education in developing countries sometimes provides help to the community by monitoring the growth of preschool children or by running feeding programmes. Although the school's goals are cognitive, nutrition education within it may be behaviourally oriented. The school garden may be used both to grow the school meal and to teach nutrition related agricultural practices. The school meal and food service also provide an educational focus in the United States.

Mass media are used differently in the two settings. Rural radio in developing countries may provide the only method of reaching vast numbers of isolated communities with consistent messages. Accordingly, much effort has gone into using radio programmes for nutrition education. Evaluation indicates that behaviour change achieved by radio alone is modest but that awareness and knowledge increase dramatically (Zeitlin and Formacion, 1981). In industrialized countries by far the greatest number of food-related messages in the media are generated by commercial advertising. In the United States newspapers, popular magazines, diet books, and television are the media that carry the burden of public education in nutrition.

Role of the Food Industry

In the United States, rates of death from nutrition-related degenerative diseases have declined steadily since about 1970. The food industry has undoubtedly played a large role in this decline by formulating and marketing nutritionally superior products. As indicated in Table 1 about two billion dollars are spent by industry each year to advertise foods that can legitimately be claimed to reduce the risk of heart disease. It is not easy to differentiate between the roles played by government-funded risk reduction programmes, by commercial formulation and marketing and by the indefinable spirit of the times. The Standford Five City Project provides an example of such interrelatedness (Clark, 1983). The project puts weekly sheets into supermarket grocery carts advising shoppers what to buy in a: 'Instead of buying ____, buy ______' format, with 12 health tips per sheet. The supermarkets request advance notice of the foods that will be recommended so that they can advertise them. Everyone benefits.

This type of interaction is still relatively rare in developing countries. However, it is a mistake to assume that food manufacturing and marketing do not affect food habits in these countries. Poor countries have an intrinsic problem in implementing the type of cooperation illustrated above. The populations that are most in need of nutritional assistance tend to be too poor to benefit from industrially formulated foods. Further work in these areas is needed. This paper has attempted to demonstrate that the barriers between developed and developing countries are more apparent than real.

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2.8 Conceptual Barriers to the Promotion of 'healthy eating'

by

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In the series of events which leads from food production to consumption there are many stages at which intervention to promote healthy eating is possible. Although it is desirable to consider the feasibility of action at each stage of this process, this paper will focus on information and knowledge and consider the difficulties which exist both in the production of accurate and useful information and in its successful communication.

Any outsider is immediately struck by the dichotomy between the language and knowledge used by nutritionists and that of educators. For nutrition educators, language is of particular significance as in order to promote healthy lifestyles they are concerned not just with academic knowledge, but with the everyday language of what Barnes called 'action knowledge'; the type of knowledge which is actually used in food selection and consumption (Barnes, 1976). The notion that children (or the public) represent 'a blank paper on which to write' has, hopefully, been abandoned. And it is also necessary to relinquish beliefs that 'the public' are feckless or irresponsible.

These ideas formed the basis of the Health Education Studies Unit's Schools project. The project focussed on an exploration of the everyday language used by children, parents and teachers to reveal underlying perspectives, action knowledge and real experiences. Although the study did not examine *nutritional* knowledge in detail, it devised a method of describing health knowledge in terms of 'levels' of depth which can be applied to nutrition knowledge. This method highlighted the difficulties encountered by children, parents and teachers in comprehending the nature of biological factors which operate at the cell level or below e.g. viruses, bacteria or hormones (Health Education Studies Unit, Schools Project, 1982). The answers given in public examinations at 16 years by pupils following a Home Economics course also illustrate this point. They refer to such things as digestion or how nutrients enter the blood stream, using correct terminology, but nevertheless often fail to appreciate that this action is at a cellular level and that chemistry is involved. When asked in class to volunteer what each nutritional factor actually looked like, not even the older students (15 year olds) attempted to answer. Unlike discussions about 'germs', there was not reference to smallness of size nor to the structure or shape of such factors. No connection at all seemed to be made with the idea of their 'chemical' base, or to how they might fit into a hierarchy-of-size of microscropic and smaller phenomena. When asked about the functions of proteins and vitamins replies often referred to them as *energy* sources. It is difficult to imagine how such detail can enter any everyday scheme of understanding without knowledge about the *nature* of nutrients, ie what they look like, what exactly they are, and *how* they act.

This mystery is confirmed by many school texts and other potential sources of information, e.g.

> 'The chemistry of vitamins is complex, and suffice it to say that their presence is essential for healthy cell metabolism in any organism. Plants are capable of synthesising their vitamins, whereas animals require them in their diet (mainly).' (Hurd 1975, p 18)

In contrast, perhaps, we might look at the information found on food packages. For example, what sense do children, or adults for that matter, make of lists of nutrients including dietary fibre or niacin? One useful approach to the exploration of what vitamins are like might be derived from the biography of experiments, e.g. 'Eijkman and a co-worker Gerrit Grijns, set out to see what it was in rice hulls that prevent beriberi. They succeeeded in dissolving the crucial factor out of the hulls with water, and they found that it would pass through membranes which could not pass protein. Evidently the substance in question must be a fairly small molecule. They could not, however, identify it.' (p 255, Asimov, 1981). The story of discovery continues to identiy vitamins in terms of 'components' and 'amines', just as earlier (p 63) it has described 'The Proteins' as 'Key Molecules of Life'.

Perhaps the use of food groups has developed, at least in part, because of these difficulties. It is certainly a natural development from the perspective of translating research based nutritional information into a more easily handled form, and we now want to consider this perspective from the point of view of the communicator. It is also necessary to appreciate that the organisation of information and teaching in terms of food groups presents other conceptual barriers.

The problems for the nutritionist seem to be continually related to a need to reduce the amount of nutrition information to a manageable size and at the same time to be able to generalise from it. In order to experimentally determine new facts, factors have to be identified and singled out, but the factor must then be interpreted in context to provide accurate meaning. The problem occurs again in a different form when the fact is to be communicated. Food is branded good or bad, because people talk about and eat food, but the context from which the health information is derived is based on the inter-relationships and quantities of different nutrients within foods and within the overall diet.

Another conceptual barrier is related to teaching in terms of a 'balanced diet'. The notion of a 'balanced diet', central to nutrition education, epitomises the problems of communicating to groups of individuals. The 'balanced diet' originally described the need to eat a variety of foodstuffs, because not all of the necessary nutrients are to be found in any one foodstuff. However, the expression is now widely used in many countries to refer to a balance of correct quantity as well as the correct types of food. But how much is too much of any particular food? And what do we mean by variety? Variety for some might be only eating the same meal six days a week rather than seven. In terms of quantity it is particularly interesting to consider the criteria by which school children assessed their own diets. Some suggested that what they had eaten was too much because it was fattening and others mentioned sugar and tooth decay. Some suggested that by eating 'too much' they would be ill or just greedy. Of those who thought that they ate 'just right' some said it was because that amount was 'normal' for them and some thought it was just right because there were three main meals or considered it so because it 'filled you up'. Perhaps we need more experiential guide points in our identification of diet improvements. This certainly links in with a known barrier for the health educator: namely the lag betweeen a health action and its perceived benefits.

Obviously, in the space of a short paper, it is not possible to do more than mention some of the issues which make for difficulty in nutritional understanding. We have only referred to a few of the important conceptual barriers.

As educators of one kind or another, we could do worse than starting by establishing the state of our own personal nutritional knowledge and habits by applying that well-tried practice of the 24 hour record to ourselves, and reflecting upon the findings. By asking ourselves questions such as 'what was eaten?', 'why' 'what were the perceived alternatives?', and most important of all, 'what are the implications for one's own health?', we may be going some way towards appreciating what the situation is for our students and people generally, and in judging how 'scientific knowledge' might best be incorporated into their existing personal knowledge of food and their ways of thinking about it and of its relationship to health. There is a wider 'context' to our understanding of 'nutrition' than just nutritional science, or what we have come to recognise as such.

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CHAPTER 3

PRIMARY AND SECONDARY SCHOOLING

In most countries of the world, all children receive some primary education, although it will be some years before all young people have access to secondary schooling. So it is understandable that the majority of papers in this chapter focus on aspects of nutrition education being undertaken in primary schools, either as part of integrated programmes of work, or through home science or health education programmes. The work which pupils do in school is often closely related to a wider community education programme involving members of the local community. The way in which liaison between the community and primary schools can lead to an improvement in the nutrition and health of primary school children is exemplified by the programmes described by Rajammal Devadas and Marcienne Darras. The scale and vision of the nutrition education and school feeding programmes in the State of Tamil Nadu in India show what can be achieved through intelligent planning and determination on the part of governments and the community.

Effective learning requires an appreciation by the teacher of the background of pupils, and of their knowledge and understanding. Johanna Edema explores some of the ideas which primary school children in the Netherlands have about food. This topic is also discussed by Jim Davies and Vivienne McLoughlin (Chapter 2) and by Jonty Crockett, who examines the 'personal constructs' of secondary school pupils. Such research is of value in the development of curriculum materials. It also emphasises how important it is for teachers to listen carefully to what pupils say, and to consider the underlying meaning of the questions they ask. But children need to be healthy if they are to learn effectively. Children who arrive at school undernourished will be unable to benefit fully from even the most enlightened and sensitive teaching, as is highlighted in the research projects described by Tirza Bentwich and Maria Galeazzi.

The final three papers in this chapter describe practical approaches to teaching nutrition designed to enable pupils to develop a range of skills, including the ability to examine and evaluate evidence. Those by Michel Regev, Barbara Lake and Robin Osner explore some of the thinking underlying the development of secondary school projects. In his paper, 'Nutrition Education viewed in the context of science education', Isaias Raw describes work with which he has been involved in both Brazil and the United States. In Brazil, the aim was to introduce simple, low-cost equipment and teaching materials into schools. It is interesting to note that the practical 'kits' of apparatus and instructions were originally designed to enable young people to carry out the activities independently of the school.

The workshop discussions covered a wide spectrum of experiences. It was widely agreed that the form, method and content of nutrition education are dependent upon the social and educational context. The need for an inter-disciplinary approach was underlined by many speakers. No single educational approach, whether directive or enquiry-based can be used in all situations. Among the many challenges discussed by the workshop were how to motivate and train teachers and workers involved with the family and the community.

Chapter contributors:-

3.1 Rajammal Devadas	Integration of Nutrition and Health Education in the primary schools of Tamil Nadu State, India
3.2 Marcienne Darras	Education in Nutrition at the primary level in New Caledonia
3.3 Johanna Edema	A sociological approach to Nutrition Education in elementary schools in the Netherlands
3.4 Tirza Bentwich	Approaches to Nutrition Education of parents and children in Israeli schools
3.5 Maria Galeazzi	The influence of school lunch on the reading performance of primary school children on Brazil
3.6 Michel Regev	'Our meals': a multidisciplinary approach to nutrition in Israeli primary schools
3.7 Barbara Lake and Robin Osner	Nutrition Education in the new Nuffield Home Economics Project
3.8 Jonty Crockett	What's in a Word? - Students' alternative frameworks
3.9 Isaias Raw	Nutrition education as viewed in the context of Science Education

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3.1 Integration of Nutrition and Health Education in the Primary Schools of Tamil Nadu State, India

by

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A nation's greatest asset is its children. They can only grow up to become productive citizens if they are helped to achieve optimum health through sound nutrition. Good nutrition provides the foundation for work, and promotes mental abilities and self-confidence. Nutrition and health education should, therefore, be regarded as an investment in the development of human resources.

According to the projected estimates of the Expert Committee on Population Projection (1981) there are some 255 million children in India under the age of fourteen - constituting 38 per cent of the total population. A great number of them come from the economically less privileged sections of the population. Indeed, many of them have only just managed to survive the effects of severe malnutrition during their early childhood and still carry the scars of their early nutritional experiences (Varma, 1978). The challenge today is to develop healthy children, who can live full lives and be of service to others.

Historical Background

The government of India has for long been concerned with the problems of nutrition and health among children, and has realised that education is one of the most important long-term instruments for the promotion of health. In 1976 it launched a Pilot Project on Nutrition, Health Education and Environmental Sanitation at the primary level through four Regional Centres, with the assistance of UNICEF, under the auspices of the National Council for Education Research and Training. Sri Avinashilingam Home Science College, as one of these Regional Centres, implemented the project in thirteen Community Development Blocks, a block being the fundamental unit of development in India, consisting of about 100 villages or 100,000 individuals. Three dissimilar areas of Tamil Nadu were selected: the coastal area of Kanyakumari, the tribal area of Nilgiris, and an underprivileged urban slum area in Coimbatore city.

The primary school, as one of the largest organised units in India, provides potentially the most effective means of imparting health and nutrition education. For here the teacher is able to influence and improve the health and nutrition of the pupils as well as that of their families and the wider community. Every village in India has a primary school which can offer effective instruction in nutrition and health to pupils and their parents in an integrated manner. It was for these reasons that the project was launched through the primary school system.

Objectives of the Project

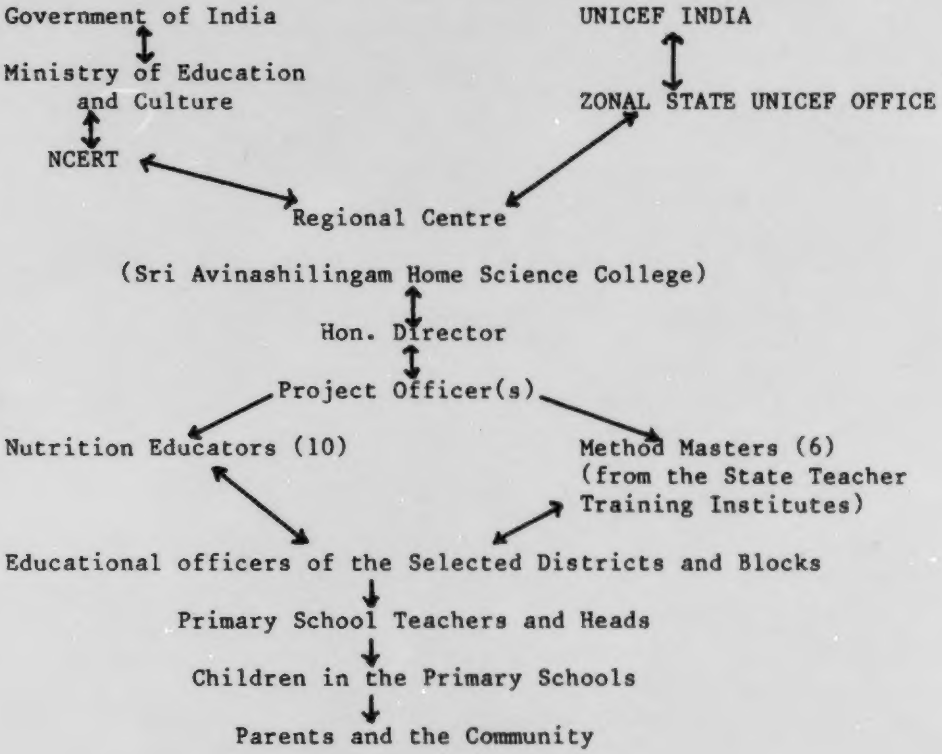
The objectives of the project for imparting nutrition and health education in the primary schools were:

- To enable children and their parents or guardians to understand that proper nutrition is essential for good health and normal physical and mental development.
- To teach children about the selection, preparation, conservation and consumption of good quality foods, and
- to help children develop desirable practices in relation to food, hygiene and environmental sanitation.

Administrative Structure for the Project

The administrative arrangements for the project are shown in Figure 1.

Figure 1 Administrative Structure of the Government of India's Nutrition and Health Education Project


Government of India
Ministry of Education and Culture
NCERT
UNICEF INDIA
ZONAL STATE UNICEF OFFICE
Regional Centre
(Sri Avinashilingam Home Science College)
Hon. Director
Project Officer(s)
Nutrition Educators (10)
Method Masters (6) (from the State Teacher Training Institutes)
Educational officers of the Selected Districts and Blocks
Primary School Teachers and Heads
Children in the Primary Schools
Parents and the Community

Stages of the Project

The project was implemented in the following sequence:

1. Selection of blocks and schools,
2. Conducting baseline surveys,
3. Development of instructional materials and teaching aids,
4. Inservice training of teachers in the selected primary schools in nutrition and health education,
5. Teaching of nutrition and health in the primary schools in an integrated manner, and
6. Evaluation.

1. Selection of the Blocks and Schools

In consultation with the Chief Education Officers of the Region and the District Development Authorities, ten Community Development Blocks in the district of Coimbatore were selected for the first phase of the project. 660 primary schools in these Blocks were included in the Programme. During the next phase, three different areas of Tamil Nadu were covered. They were two Community Development Blocks one each in the districts of Kanyakumari and Nilgiris and an urban slum in Coimbatore. In addition, 285 primary schools operating in these districts and the city were included.

2. Conducting the Baseline Surveys

The broad objective of the baseline surveys was to understand the habits, customs, traditions and beliefs in relation to food, and their likely impact on the nutritional status of the population in general, and of school children in particular. In order to throw light on this, a variety of cultural, social, demographic and economic data was elicited from 2,651 families in the twelve blocks and in the urban slum. Ten qualified nutrition educators were specially appointed for this purpose and given one month's orientation. They conducted the surveys and helped to train the primary school teachers.

3. Development of Instructional Materials and Teaching Aids

The result of the survey enabled priority areas to be identified, so that a practical and workable nutrition and health education programme could be evolved. An instructional manual was developed in Tamil, the regional language, for use by primary school teachers. Supplementary readers for the children, posters, leaflets, flash cards, models, games and charts were also developed.

4. Inservice Training of the Selected Primary School Teachers in Nutrition and Health Education

The teachers needed training in order to teach the integrated nutrition oriented curriculum effectively. Special orientation courses each of five days' duration were conducted in the teachers' centres for all the 5,800 primary school teachers drawn from the 945 primary schools, over a period of eight months. The ten trained nutrition educators worked in pairs in conducting the courses at five different places, in each of which some fifty teachers underwent training. To enable the teachers to attend the orientation courses, all the primary schools involved were closed by the order of the State Director of School Education for a period of five days. The five days' programme included:

Introduction to the principles of nutrition
Functions of food and nutrients
Deficiency and infectious diseases
Characteristics of healthy children and assessment of nutritional status
Prevailing food practices
Food availability and family consumption
Desirable health and hygienic habits, including sanitation and cleanliness of the school lunch room and its surroundings and the need for safe drinking water.
The adequacy of the school meal; proper methods of food preparation
How to improve the school garden
Presentation of model lessons by the participating teachers
Field visits to school lunch programmes, and
Evaluation of the course by the teachers.

The teachers' knowledge on nutrition and health concepts was assessed before and after the five days' training programme using a questionnaire. At the end of the five days' training period, the teachers were each provided with a copy of instructional material, and each school was supplied with a set of posters on the concepts of nutrition and health and a copy of the integrated syllabus for their reference.

5. Integrated Teaching of Nutrition and Health in the Primary Schools

The teachers spent about one and a half hours each day studying ways of integrating nutrition and health concepts into all the school subjects, namely: Arithmetic, Languages, History, Geography, Science, and Arts and Crafts. Since the class teacher system prevails in Tamil Nadu, it was easy for the teacher to adopt the integrated curriculum.

6. Evaluation An evaluation of the programme was carried out continuously by monitoring by means of visits, reports, tests, questionnaires, interviews, meetings and observations on the health practices of the children and their families. The evaluation included examination of the cognitive gains and nutritional status of the children. The knowledge acquired by the pupils in nutrition and health education was tested, after a period of six months. The test consisted of 25 true or false items and multiple choice items. The curricular validity of the test was obtained by identification of content and instructional objectives and determination of the relative emphasis given to each content area. The pre-test scores revealed that children originally possessed little knowledge of nutrition or health. But the post-test scores showed significant gains in their knowledge as a result of the programme, as is shown in Table 1.

Table 1: Gain in Nutrition and Health Knowledge of the Pupils

Number: 300 in each area Maximum score: 25

Area	Mean Score		
	Pre-Test	Post-test	Mean gain
1. Kanyakumari	5.85	20.57	14.72
2. Coimbatore urban slum	5.79	19.65	13.86
3. Nilgiris	2.14	16.67	14.53

Improvement in Nutrition, Health and Environmental Sanitation Practices of Children

A rating scale combined with a participant observation technique was used by the investigators to score the practices. A checklist containing the eleven aspects mentioned in Table 2 on nutrition, health and environmental sanitation was formulated, and the practices of the children were observed and recorded. To substantiate the observations of the investigators, the parents were also interviewed on the practices of their children in their home settings. The differences between the nutrition, health and environmental practices of children before, and six months after, nutrition education, are shown in Table 2.

Table 2: Nutrition, Health and Environmental Sanitation Practices of Children

Number: 300 in each area (same as in Table 1)

S.No.	Nutrition in health practices	Percentage	
		Before	After
1.	Including raw vegetables in the diet	10	44
2.	Eating all the foods without wasting	20	56
3.	Including the seasonal fruits in the diet	12	44
4.	Brushing the teeth every day	60	95
5.	Rinsing the mouth after eating sweets	0	55
6.	Washing the fruits and vegetables before eating them raw	15	54
7.	Drinking boiled and cooled water	8	59
8.	Keeping the nails trimmed and clean	18	75
9.	Keeping the surroundings clean	13	73
10.	Using a dustbin to throw waste	7	65
11.	Buying eatables exposed to flies	75	15

The nutrition, health and sanitary practices of children after participating in the school nutrition education programme, showed a highly significant improvement in certain respects. For example, it was a common practice for children to buy sweets and other eatables which were exposed to flies. But after six months of nutrition and health education, the percentage of children buying exposed foods fell from 75 to 15. The aspect in which the least improvement was noted was the inclusion of raw vegetables and fruits in the diet. This would have been difficult for want of money. It should improve when the purchasing power of the families rises.

Improvement in Nutritional and Health Status of Children

One of the objectives of nutrition and health education was to enable the children and their parents or guardians to identify clear signs of deficiencies, and to follow the advice given on the choice of foods needed to overcome the deficiencies. For this reason it was decided to assess the improvement in the nutritional and health status of the pupils in terms of the disappearance of observed deficiency symptoms in the children and the reduction in absenteeism due to illness, as well as through anthropometric measurements. The teachers maintained health cards for each child and conducted monthly health inspections. It was found that there was a considerable reduction in the deficiency symptoms among the pupils after six months of nutrition education, as is clear from Table 3.

Table 3: Disappearance of Observable Deficiency Symptoms

Number of Pupils 25,000

S. No.	Observable Deficiency symptoms	Number of children affected	Percentage cured
1.	Angular stomatitus	1,960	24.7
2.	Bleeding gums	2,455	30.4
3.	Sensitivity to light	1,460	19.5
4.	Weakness and inactiveness	3,350	41.7
5.	Dry and scaly skin	2,500	60.1
6.	Bitot's spots	1,800	52.2
7.	Redness of the eyes	2,000	60.0
8.	Dry and scanty hair	1,500	50.0
9.	Browning of hair	1,200	60.6

The improvements in the reduction of nutritional deficiency symptoms indicate that the teachers and parents were taking effective steps in reducing the magnitude of the nutrition problems confronting the children. Many teachers, who were involved in this programme, showed a considerable sense of commitment in dealing with the problems in providing children with sound nutrition and health information within the framework of relevant integrated curricular activities, and the limitations imposed by economic conditions. These findings agree with the earlier findings of Devadas and Chandrasekar (1970) that nutrition education is effective when geared to the needs and problems of the learners.

The most serious problems encountered in the course of the universalisation of primary education in India are absenteeism, drop-out and the consequent wastages. These may be attributed to frequent illnesses, the need for taking care of younger children at home when both the parents go away for gainful employment, or to children themselves going out for part-time employment. The information obtained from the teachers revealed that after nutrition and health education there was a ten per cent reduction in absenteeism of children due to reduction in illnesses.

The height and weight of the boys and girls over a period of six months were recorded. Although height is a genetic factor, many children do not achieve their full potential for growth for a variety of reasons including illness, malnutrition or intestinal disorders. The increases in height and weight were found to be statistically significant, indicating that the nutritional status of the children had improved.

Development of Positive Attitudes

Attitudes are related to knowledge. Knowledge of nutrition, which is imparted effectively to children helps to promote desirable changes in their attitudes. The attitudes of children towards eating food, illness, nutrition and health were assessed using a test containing 15 statements. An attitude inventory was designed to evaluate the children's perception of the importance of nutrition, causes of illness, health and environmental sanitation. The children were asked to respond to each statement by indicating whether they agreed or did not agree. The results indicated that nutrition and health education had helped children to develop positive attitudes: the results were statistically significant (at five per cent level).

The Community Contact Programme

The community is the service centre for nutrition education. People, food, knowledge, behaviour and the market place come together in the community. Outside the classroom, parents influence the dietary practices of their children throughout the school years. Therefore, teaching the parents, particularly the mothers, nutrition and health in their home settings was attempted. As Church (1971) points out, the mother can be a factor of success in relating nutrition knowledge to food behaviour by the child. During the International Year of the Child, 1979, nutrition and health education was extended to the community through the children and teachers.

The main objectives of the community contact programmes were to:

- Encourage the parents to immunise their children at the proper time, to keep their surroundings clean, and use those local foods which are particularly nutritious,
- Help the parents to become aware of the health facilities available at the village level,
- Involve the Primary Health Centres, Maternal and Child Health Centres, and the village level extension and health workers in the nutrition and health education programme, and
- Increase the sanitary facilities, such as water-seal latrines and soakage pits through self-help measures.

The contact programmes were carried out in thirty villages, ten in each of the districts of Coimbatore, Coastal-Kanyakumari and Tribal-Nilgiris through home visits, method and result demonstrations, meetings of the Parent-Teacher Associations, puppet shows, folklore, mass immunisation campaigns, cleaning drives, debates and group discussions. These were conducted in the evenings when the parents were available after completing their day's work. Eleven important messages in Nutrition and Health were identified, which were conveyed to the community through the contact programme by the teachers after their working hours. Each teacher spent approximately two hours each day communicating nutrition and health messages to some forty to sixty families in his village. The contact programme was carried out for six months in all the villages. Each teacher spent on average 120 days for twenty contact programmes. The programme had evaluation built into it.

The impact of the community contact programme was evaluated by looking at the cooking of food, feeding and sanitary practices, the ability of parents to identify deficiency symptoms and differences in the practices of children whose mothers had received nutrition and health education, with those whose mothers had not.

Table 4: Changes in Cooking Practices

Number: 50 Families in each of the three areas

S. No.	Cooking Practices	Number of Families Reporting					
		Coimbatore Urban Slum		Coastal district		Tribal district	
		B	A	B	A	B	A
1.	Washing the vegetables before cutting	15	40	12	36	9	25
2.	Cutting the vegetables into big pieces	6	38	15	40	25	45
3.	Using just enough water to cook	3	27	0	15	0	19
4.	Avoiding over-cooking of vegetables	10	30	18	32	16	31
5.	Not draining the cooked water from greens and vegetables	13	40	12	33	15	34

B. Before A. After

Changes in Cooking Practices The use of inappropriate methods of cooking causes a loss of nutrients, and is one of the factors leading to malnutrition and deficiency diseases. The changes in the cooking practices adopted by the mothers after the contact programme are shown in Table 4. Except in the case of using just enough water to cook, there was considerable improvement in all the practices.

Ability of Mothers to Identify Deficiency Symptoms Before nutrition and health education, many mothers considered deficiency symptoms such as dry skin, muscle wasting due to starvation, and oedema in kwashiorkor, as 'normal' childhood diseases. Puffiness of the face in anaemia, and oedema in protein energy malnutrition (PEM) were mistaken as healthy signs instead of as deficiency symptoms. Therefore nutrition education was aimed at making the mothers aware of the deficiency symptoms and the underlying causes. The number of mothers who were able to identify the presence of nutritional deficiency symptoms before and after the educational experience is shown in Table 5. The improvement in the number of mothers who could identify protein energy malnutrition, dryness of skin and dermatitis, unhealthy hair and fatigue, indicates that the education imparted was both effective and much needed.

Table 5: Number of Mothers who could Identify Clear Signs of Nutritional Deficiency Symptoms among Children

Number: 100 in each of the three Districts.

S. No.	Deficiency Symptoms	Percentage Reporting					
		Coimbatore Urban		Coastal		Tribal	
		B	A	B	A	B	A
1.	Angular stomatitis	2	60	4	70	3	69
2.	Bleeding gums	3	72	2	76	2	70
3.	Anaemia	0	59	0	62	0	65
4.	Protein Energy Malnutrition	0	72	0	60	0	79
5.	Weak and inactive	0	43	0	51	0	41
6.	Night blindness	0	43	0	41	0	42
7.	Dryness of skin	0	35	0	37	0	40
8.	Unhealthy hair	0	39	0	40	0	46
9.	Fatigue	0	39	0	40	0	48

B. Before A. After

Changes in Dietary Practices Prior to the education programme, the diet was a monotonous one consisting of cooked rice (or other locally available cereal) with the possible addition of a small amount of pulses, vegetables or fleshy foods. This was the case from the weaning stage to adulthood and old age. As a result of the programme, notable improvements were evident in the consumption of all the protective foods including vegetables and fruit. However, the least improvement was in the consumption of milk and its products. This is understandable, since milk is an expensive and rare item of food in the villages.

Differences in the Practices of Children whose Mothers had Received Nutrition and Health Education Contradictions between the home and the school can all too readily result in failure in bringing about desirable changes in the nutritional and health practices of children. An attempt was therefore made to compare the practices of children whose mothers had received nutrition and health education with those whose mothers had not. The results are shown in Table 6. It is apparent that when mothers and children were educated in health and nutrition, their habits showed greater improvement than when children alone were educated. Since the parents and elders are the decision makers in the home, the small voice of the child can sometimes go unheard. Nutrition and health education programmes must therefore aim to reach both parents and children (Devadas, 1981).

Table 6: Comparison of Nutrition and Health Practices of Children whose Mothers had received/not received Nutrition and Health Education

Number: 100 in each

S. No.	Nutrition and health practices	Per cent Children Reporting	
		Mothers (nutrition education)	Mothers (no nutrition education)
1.	Including greens in the diet	60	10
2.	Including raw vegetables in the diet	45	13
3.	Rinsing the mouth after eating sweets	38	2
4.	Drinking boiled water	40	5
5.	Washing the hands before eating	58	7
6.	Trimming the nails and keeping them clean	62	8
7.	Cleaning the plate before eating	38	18
8.	Using the dustbin to throw the waste	48	10
9.	Spitting in the spitoons	50	3
10.	Covering the mouth with handkerchief while sneezing	47	2
11.	Cleaning the place after eating	59	4

Conclusion

This study was conducted to find out the feasibility of imparting nutrition and health education through an integrated curricular approach and to assess its impact on the health and nutritional status of children. The impressive results obtained have led to the launching of nutrition and health education programmes in the primary schools throughout India. These are being supported by a new generation of packaged learning materials, which are tailored to meet local circumstances and conditions.

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3.2 Education in Nutrition at the Primary Level in New-Caledonia

by

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New-Caledonia is an island lying in the South Pacific Ocean with a population of 144,000, of whom 30 per cent are under the age of fifteen. Schooling is free and compulsory from the age of six to sixteen. In the primary schools there are some 27,000 children between the ages of 5 and 14. The South Pacific region is becoming quite rapidly urbanised, and this is causing a decline in the general nutritional status. For this reason, a comprehensive nutrition programme has been set up, which is aimed at local agricultural and health personnel, and at school teachers. It should be said that the rural health educators and the 'Vigiles de Sante' volunteers work quite effectively at the community level. Nutrition education is a very recent activity in schools, and perhaps the need for it is not quite as great as in some other countries. Nevertheless, there is a need.

It may be asked why we have waited until 1982 to start nutrition programmes in schools. The simple reason is that the teachers were not prepared for it - the teacher training colleges never thought of training the teachers for nutrition teaching in the schools - and the absence of health education in the schools. The motivation developed after my Department organised a seminar to which the Director of Education, several school principals and some teachers were invited. We tried to study with them the different health problems in the schools, and of course also in the community. The result of the seminar was a written recommendation, conveyed to the Education Department, that Health Education, with nutrition as part of the package, must be clearly mentioned in the school curriculum.

My objective, as the person responsible for health education, was to promote nutrition through the schools, thus involving the community in promoting health. This would be very difficult if we worked only with the health educators at the community level. We thought that by using the schools we would be able to make the link between the schools and the community. We have been trying to make the teachers realise that it is necessary to teach nutrition in the schools, and to have within the education programme at primary level a part especially reserved for nutrition and health education. At the same time, we are working on the production of a health education curriculum. We are very fortunate in that the medical and educational sections are working so closely together. Of course, there was a problem initially because the teachers had not been trained to teach nutrition, and because they lacked the resources. We therefore started to produce resource materials in my Department, and to make it easier for the teachers we opened it up so that they could come and see everything we have.

We have been working very closely with the eighteen medical districts on the island. This work has provided the teachers with the opportunity of looking at medical aspects involving the children. Each year all the children have a medical examination which is carried out by a doctor. The teachers can see the growth chart of the children, their weight and height, which impresses on them the importance of nutrition. Furthermore, the doctor can talk to the teachers. This may seem a very simple point, but it is no mean achievement in a country like mine where there are about 3000 people to one doctor, for the doctor to make time to talk to the teachers and answer their questions.

When it has been decided that nutrition must be taught in the schools, the teachers are asked to volunteer. This is because real motivation is needed to teach health education. It is not yet compulsory to teach health education in schools if teachers do not want to do it; it is useless to force them to do so. I feel that in a situation in which we can easily control what is happening, it is better to wait until there is the motivation. I must say that such motivation is coming faster than had been expected at the beginning. Volunteer teachers can attend training sessions organised by the Health Education Department.

At the moment, most, but not all schools are teaching nutrition. As I mentioned, the content of the programme that has been set up is not official. It comprises general knowledge about nutrition, the essential problems of nutrition, frequency of malnutrition and its dangers, simple ways of recognising malnutrition, classification of food into three groups and the role of these in a balanced diet, local protein production as vegetable and animal protein, food hygiene (protecting food from flies and so on), the importance of washing hands before eating, fresh food and the different methods of cooking. It is intended that the same programme be followed at school level and at the community level by health educators. We feel that it is important to have the same objectives for the school and the community. That is why we are using the same materials for the schools and for the community in most cases. I know how important it is for the child to come home from school having been told the same things as the health educator is saying in the community. This is very important for community participation and to help people to believe that what has been said is possible. In communities where the level of education is low, what is taught in the schools is thought of as very good. If the health educator says something at the community level which is also being said in the schools, that gives more importance to what he both says and does.

Our overall objective is to improve the nutritional status of the families as part of a country-wide health promotion process. We see nutrition as an essential component in the promotion of health within the community. The material we use includes slides, documents and flipcharts, and is available to all schools in New Caledonia. It is a great pleasure for me, as responsible for health education, to say that since 1st March 1983, (the beginning of the school year) my Department has been crowded with teachers every Wednesday (their free day). They come to my office for slides, documents and so on, and we have had to set up a special service within the Department for health education in the schools. Of course, we have not yet achieved all we want to achieve, but it is a very good starting point. We know that what is used in schools is the same as is used in the community and the availability of appropriate teaching materials makes it easier for teachers to start teaching about nutrition. Also in March 1983, a section attached to the Teachers' Training College was created to collect all the educational materials that could be used by teachers, and to prepare new materials, such as slides and pamphlets in collaboration with the Health Education Department. As far as the method of teaching is concerned, I trust the teachers to use an appropriate method, based on the pedagogic methods used in primary schools, which start from "what do we know? what do we see? what has to be done?", and ensure that pupils learn by doing. As long as they are given the necessary theoretical knowledge of nutrition, they will be able to use it effectively with the children - indeed more so than either the doctor or myself. I would like to give an example. Recently I visited a school in which there are twenty two children. This school is very close to the local community, which has a population of 126. The school lunch was found not to be balanced, so together with the teachers we decided to see that the children had a balanced diet, at least for their lunch, by the children themselves making discoveries. As soon as they understood the idea of a balanced diet, they realised that their lunch was not balanced. They also saw that what was missing was available in the community, and that the parents were not preparing those foods and putting them into the children's lunch baskets.

The children first said that their parents should be told what to eat. And indeed, the health educators have already explained it to the parents, but people's food habits are very difficult to change. When they have some money they buy tinned food and similar things. If they have four or five children at school, they cannot afford to give all of them a good lunch - because they do not use locally produced food.

During a month of observation, we left the parents alone. The children realised that their lunch had not changed. The children then said that as they had no green leaves or raw vegetables in their lunch, why could they not grow them at school? They decided to grow their own vegetables (such as carrots and lettuces) at school. They then realised that if they grew vegetables at school, they would also have to prepare them there. The teachers were willing to help them (with me behind, pushing them a little). We had hoped that would happen, so had already prepared a small store, but we waited until the children asked to grow the vegetables. One day somebody came from the Agricultural Department and told the children how to plant the vegetables. That was another side of this multifactorial intervention within the school.

On another occasion, a child said to me that a lot would have to be planted to feed his family of ten. That led us to the importance of family planning: the children could see that family planning and nutrition are very closely related.

The children also learnt (and we have put a lot of emphasis on this) about the frequent problems of anaemia and so on. We asked them what was still missing in their diet. They said that eggs were needed, so they decided to keep a little poultry. The parents gave some money, a small enclosure was built, some chickens were brought from their homes, and the children then had eggs in the school. The teachers were very surprised at all that was happening.

Parents became curious and came to school at lunch time to observe what was happening. We thought that they would say that now the school was doing so much they could forget about the children's lunch. That did not happen, however, and the community has become involved in that way. It seemed that the mothers did not want to have to say that the school was providing the lunch for their children. We noticed that the lunches were changing; the mothers were putting in green leaves, eggs and so on. The result was that the school production of these things was too great, so the children started to sell their produce. This gave some of the mothers the idea of raising chickens and of selling eggs and also of growing and selling lettuces. A whole development process has begun within the community from what was started in the school. I think it is very important to make a close link between the community and the schools.

We also have a volunteer health worker, working at the community level, who makes the link between the school and the parents. He comes to the schools to see what is happening, and is a sort of 'correspondent' between the medical and the health education sides, but he is somebody living in the community who understands the local traditions, culture and customs. Our objective was to make people assume their responsibilities by promoting their own health and also to create a link between the community health promotion programme and the school health education programme: to work it as an integrated development project, supervised by the Health Education Department using 'Children Teaching Parents', with teachers and community health educators using the same teaching material in the school and in the community.

In New Caledonia the Health Education Department is involved in all aspects of nutrition education; there is also close collaboration between Public Health and Education Departments. After the establishment of the official Health Education curriculum in schools, our next concern is teacher training. It may seem that I am very optimistic about this project - but I trust the power of children to change the world. By giving more importance to the children and to health education in the schools we will reach the goal of health for all by the year 2000.

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3.3 A Sociological Approach to Nutrition Education in Elementary Schools in the Netherlands

by

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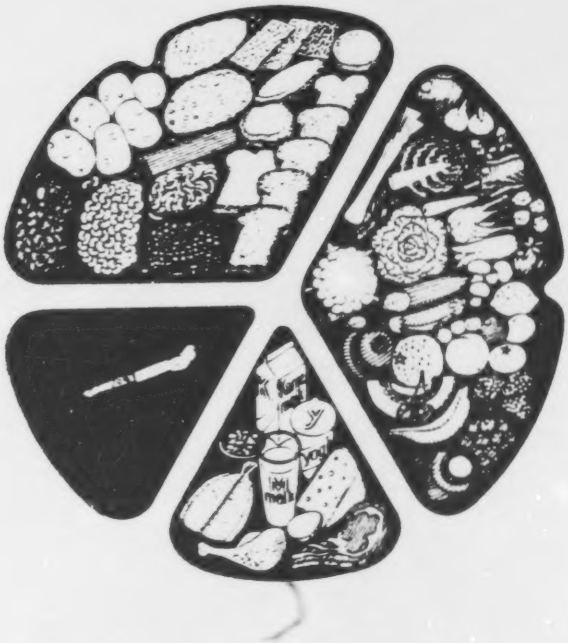
For more than a hundred years nutritionists in the Netherlands have been advocating that nutrition should be a compulsory subject in elementary schools. In 1985, new legislation on elementary schools will at last bring this into effect. However, the content and teaching approach of the new course in nutrition have yet to be decided. It should be noted that school meals are not generally provided in the Netherlands, so there is no opportunity to use them as a point from which we can teach the principles of good nutrition. However, at least three institutions have for some time been trying to introduce Nutrition Education into elementary schools on a voluntary basis in an attempt to improve the children's food habits. Their efforts were not as successful as expected, which was attributed to the teachers, parents, and children, respectively. There are two reasons why this result could have been expected, as the little effect nutrition education has on adults was one of the main reasons for these institutions to try and introduce Nutrition Education into the elementary school. Here one is concerned with the adult as teacher or parent. Why should these adults believe that children should change their food habits when they do not see the need to do so themselves? At least teachers will consider the need for Nutrition Education in elementary schools in the light of their own experience. Further, they will view it in the context of their own teaching expertise, and the observations they have made about their pupils' family life.

As little attention has been given to this aspect of nutrition education, three of my students decided to write their theses for their master's degree in Human Nutrition on this subject (Berkvens et al. 1983) and two more investigated further aspects of Nutrition Education in elementary schools. They were especially interested in the association between two classifications of foods, known as Maaltijdschijf and Voedingsplank, and the spontaneous classifications of foods made by 11 - 12 year olds (Molter and Borg, 1982). It should be recalled that Contento (1981) discovered that children perceive foods quite differently from adults, although Piaget (Kranenburg, 1983) contended that children below the age of twelve are generally unable to comprehend abstract concepts. It is, of course, true that the Maaltijdschijf (Figure 1) and the Voedingsplank food classifications depict concrete items of food. However, the four groups of the Maaltijdschijf, as well as the three groups of the Voedingsplank (Table 1) are based on abstract concepts such as 'energy', 'joules', 'vitamins' and 'cholesterol'. It would at first appear that they are therefore comprehensible only by those who are able to work at the level of abstract thought. However, this would not be the case if these groupings could be shown to be identical to those the individual would arrive at in applying criteria considered relevant.

These nutrition students reached conclusions which motivated a sixth student to repeat their research as closely as possible in another town (Fransella and Bannister, 1977). In two investigations 177 and 95 children (11 - 12 year olds) completed individual test papers in class. A seventh student tried at the same time to discover from a group of about a hundred children the criteria they used in classifying foods by applying the so-called Repertory Grid Technique (Roorda and van Maaswaal, 1983). This is a technique used by psychologists interested in an indivual's perception of the outside world (Cramwinckel, 1983). Therefore it seemed worthwhile to test its usefulness in the area of popular classifications or ethnotaxonomies of foods. The results showed that the Repertory Grid Technique is applicable but cannot replace the standard techniques of the social sciences.

Figure 1 The Maaltijdschijf classification of food



Enquiries on Nutrition Education in Elementary Schools

The students asked the teachers the following questions:

- when you teach nutrition, what is your motivation for doing so?
- which nutritional problems do you see among your pupils and in society at large?
- what is, in your opinion, the Elementary school's proper task: should nutrition education be included in the curriculum?

Table 1 The Three Groups of the 'Voedingsplank'

Name	Basic foods	Supplementary foods	Non-essential foods
Definition	Healthy food products which provide sufficient amounts of favourable* and small amounts of unfavourable** components	articles of food containing some favourable* as well as some unfavourable** components	foods containing larger amounts of unfavourable components
colour of background when foods are depicted	green	orange	red
Examples	Vegetables (fresh, canned, (frozen) fruit (fresh) tomato juice	Cheese, egg, chicken lean meat and fish, fruit (dried or canned in syrup), fruit juice banana, peanuts, peanut butter, apple butter, sandwich spreads	Fatty meat and fish, sausages, currant and gingerbread, soft drinks, alcoholic drinks, grape juice, coffee, marmalade, honey
	Potatoes whole meal products brown rice, skimmed milk and milk-products	Milk and milk products with 2-5% butterfat 50-60% polyunsaturated margarine, soft margarine, mayonnaise, salad dressing, barbecue sauces, porridges and custards, cocoa	French fries, white bread, cake, biscuits, cornflakes, refined starch, whipped cream, powdered coffee cream, butter, frying fats Chocolates, sweets, ice cream, liquorice, chewing gum, sugar

* favourable nutrients: linolenic acid, dietary fibre, vitamins, minerals

** unfavourable nutrients: saturated fatty acids, cholesterol, sugar, alcohol

These students, being the first to investigate these issues in the Netherlands, decided to use exploratory studies and the well-known sociological technique of in-depth interviews. From the data which they collected, it emerged that when nutrition is taught it is for the following reasons:

- children should be able to look after their own health
- children should learn to respect nature as well as the people who provide us with our food
- children should learn to respect and understand other people's food habits, so that they will become less aggressive and more tolerant towards them.

This point was raised by teachers who themselves practised alternative food habits and by those who had many children of migrant labourers in their classes.

The interviewees' ideas of the nutritional problems among school children appeared to depend on social class. It was found that teachers whose pupils' social standing was lower than their own saw more problems than those whose social level was the same or less than that of the pupils. All those interviewed, however, shrank from the idea of teaching food habits which would run counter to those of the pupils' parents. But teachers of lower class children seemed more disposed to teach nutritionally approved food habits than those whose pupils belonged to a higher social stratum.

It is impossible in this short paper to discuss fully the implications of all the data which was gathered. Suffice to say that the data allowed us to formulate hypotheses about relationships between ideas on nutrition education on the one hand and distinct social variables on the other, and to put these hypotheses to quantitative tests.

School children's criteria for grouping foods

The investigators found little agreement between the groupings of foods in the Nutrition Education Aids 'Maaltijdschijf' and 'Voedingsplank' on the one hand and the groupings their young respondents made. There was not even agreement among the hundred children, who had received nutrition education during the previous school year, when the 'Maaltijdschijf' had been used. They rarely used abstract headings like 'It is wholesome'. On the other hand, they used a diversity of remarks indicating concrete thought, such as 'what do they look like?' (e.g. are they oblong or round), 'how do you eat them?' (e.g. cooked or raw, hot or cold), 'what is their colour?' 'at what time of the day do you eat them?' Other remarks made included 'is it for children or for grown-ups?', 'is it for a weekday, a Sunday or a birthday?'. The latter refer to the concepts of 'social distance' and 'social time' which are shown in the diagram of the Culture of Eating, Figure 2.

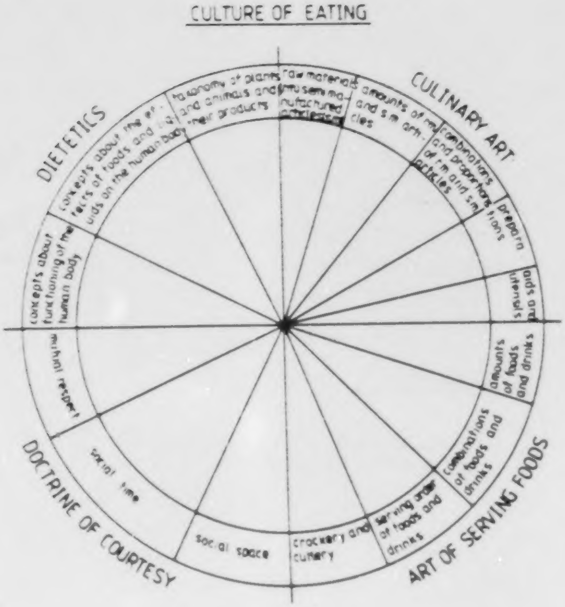
When looking for differences among their respondents based on sex, social class and place of origin, the investigators found that:

- the boys knew more about the production of foods, while the girls knew more of the food preparation. This suggests that in the area of food habits, boys and girls undergo different types of socialization.

- mushrooms, eggplant and green peppers were identified by more children from the higher social classes than by those of the lower classes. This difference could be accounted for by the Dutch habit of using these foods only in sophisticated meals and dishes, and the preference of lower class people for time-saving and plain cooking.
- only minor differences were found between children who went to school in the same town they were born in, and those who had been born elsewhere.

In conclusion it should be said that the investigations presented in this paper are but the first steps of a larger research project focussed on an optimalization of nutrition education in the elementary schools in the Netherlands.

Figure 2 Cultural Aspects of Eating


CULTURE OF EATING
DIETETICS
CULINARY ART
ART OF SERVING FOODS
DOCTRINE OF COURTESY
taxonomy of plants and animals and their products
raw materials and semi-manufactured articles
amounts of raw and semi-articles
combinations and proportions of raw and semi-articles
preparations
aids and utensils
amounts of foods and drinks
combinations of foods and drinks
serving order of foods and drinks
crockery and cutlery
social space
social time
mutual respect
concepts about functioning of the human body
concepts about the effects of foods and liquids on the human body

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3.4 Approaches to Nutrition Education of Parents and Children in Israeli Schools

by

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The importance of breakfast in the nutritional scheme of balanced eating habits has been recently questioned in a review by Dickie and Bender (1982), though Wells (1981) and others believe that breakfast should be regarded as an important part of a balanced nutritional scheme, particularly of growing children. Several reasons are given by those who do not eat breakfast, the most important being: lack of awareness of its importance: pressure of leaving early for school and work (particularly for working mothers); and the idea that skipping breakfast may be very helpful in losing weight. It has been suggested that the practice of missing breakfast may be partly responsible for the inability to concentrate, irritability and overeating, and for obesity due to increased uncontrolled hunger that may commonly occur after missing breakfast. (Tuttle et al. 1954, Huenemann, 1972). The ill effects of poor breakfast habits is exacerbated by the fact that most mothers go out to work and their children may have to wait for some time for lunch. A break for a mid-morning snack is usually provided in the schools, although it is not clear how many children bring food with them. Simple foods can be bought near many schools by those who have the money in their pockets.

An awareness of this important subject, and the active involvement of the community, could serve as a corner-stone for various nutritional education programmes in the schools, and in the community at large.

Methods

A survey on breakfast eating habits was carried out in a primary and a secondary school in the town of Rehovot. The catchment area for the schools is predominantly a middle class area. This was carried out by interviewing 185 children aged 6-12 at the primary school, and 352 children aged 13-17 at the secondary school. The interviews were performed by students of the School of Nutritional and Domestic Sciences, as part of their normal studies in health education. The interviews were held during May, 1982, using a questionnaire which was specially prepared for the purpose. During the interview, children were able to ask their interviewers questions relating to nutrition in general or to the questionnaire in particular.

Results

- Numbers eating breakfast As can be seen from Table 1, only half the children eat breakfast regularly, while 81 per cent had some sort of a drink. More primary school children had something for breakfast than those in secondary schools.

Table 1 Percentage of pupils eating or drinking at breakfast time

	Primary School (185)	Secondary School (352)	Total (537)
Eating	60%	44%	50%
Drinking	90%	76%	81%

- Composition of breakfast The food selected for breakfast was much the same in the two schools (Table 2). Bread of one sort or another was eaten by three-quarters of the children, whereas milk products, vegetables and eggs were eaten by much smaller numbers of children.

- Parents' attitudes to breakfast As can be seen in Table 3, there was considerable variation as to the member of the family responsible for the preparation of breakfast. Children in secondary schools prepare breakfast as often as their mothers, while in the primary school, mothers do it for rather more than half the children. It is interesting to note that about half the secondary school children are of the opinion that their parents do not attach much importance to breakfast (Table 4).

Table 2 Composition of Breakfast*

	Primary School (155)	Secondary School (259)	Total (414)
Bread	76%	74%	75%
Cake, Biscuit, Cracker	12%	11%	12%
Fruit	13%	22%	19%
Vegetables	15%	11%	13%
Porridge, Cereals	6%	8%	7%
Egg	15%	13%	14%
Dairy Products	Unknown	29%	-

* Calculated according to those children who eat breakfast regularly or occasionally

Table 3: Family members responsible for preparation of breakfast*

	Primary School (139)	Secondary School (291)
Mother	55%	37%
Father	9%	5%
Self-prepared	16%	40%
Varies from day to day	20%	18%

* Calculated according to those children who answered this question

Table 4: Importance to parents of breakfast eating by children (as the children see it)

	Primary School (185)	Secondary School (352)
Very important/important	63%	49%
Not important/don't know	37%	51%

- Children's attitude and feelings About half of the primary schoolchildren said that they felt hungry before breakfast, compared with a much smaller proportion of secondary school children. The children's motives for having breakfast are summarised in Table 5. Most of them said that they ate breakfast because they wished to do so, and only a minority said that they did so on account of their parents' wishes. It is apparent that breakfast is eaten in a hurry by most of the children, whether gauged 'subjectively' or by real time. Breakfast was generally eaten in the company of other members of the family. Only about a fifth of the children who ate breakfast did so on their own. The habit of eating breakfast on the way to school was not at all common among primary schoolchildren, but about a fifth of the secondary school pupils did so.

Table 5: Motivations for breakfast eating by secondary-school children

	No. of Children (352)	Percentage of Children (100%)
Self decision	290	82%
Family routine	49	14%
Demand/request of parents	13	4%

- Self weighing and body image It was perhaps surprising to find that most of the children weighed themselves regularly daily, or at least weekly. This was particularly so among children of secondary school age. The 'self' body image and the body image in the eyes of friends is summarised in Table 6. Though the differences are small, there was a clear tendency for individual children to exert a stricter judgement on themselves than their friends did. Only 30 per cent of primary school children considered themselves thin, while 44 per cent of their friends did so. In the case of the secondary school children, their figures were 21 per cent and 37 per cent respectively. In the secondary school, more consider themselves fat (23 percent) compared to how their friends see them (16 per cent).

Table 6: Self Body-image*

	Primary School**		Secondary School**	
	Body Image		Body Image	
	Self	Friend	Self	Friend
Thin	30%	44%	21%	37%
Average	52%	30%	48%	36%
Fat	6%	7%	23%	16%
Unknown	12%	19%	8%	11%

* "Friends" Image" (as seen by the interviewee)

** Primary School - 185 schoolchildren. Secondary School - 352 schoolchildren

This survey points, as others (Birmingham, 1977; Robertson, 1971; have done, to the fact that skipping breakfast is very common among children, particularly those of secondary school age. Furthermore, when breakfast was consumed, it was often not nutritionally balanced. Though our survey does not allow us to draw firm conclusions, we suggest that a combination of factors contribute to the habit of not eating breakfast. These are the lack of a central figure to prepare breakfast, the lack of a positive attitude to eating breakfast on the part of the parents, and the fact that children did not feel hungry before breakfast. The weight consciousness of the children and their concern for being too fat or not thin enough is probably also a contributing factor. Due to the lack of proper instruction on the importance of balancing food intake with weight control, the children tended to think that skipping a meal was desirable.

This survey is not representative of all the schoolchildren in Rehovot. As it was carried out in schools in a fairly well-to-do area, the results can only serve as indicators for further studies. The results identified a number of 'treatable factors' within the family and the school system. It is clear that instruction on the importance of breakfast within the context of a balanced food intake is urgently needed by children, parents and teachers. Special emphasis should be placed on the specific needs of children at various ages, and on the way breakfast should be prepared - it needs to be made attractive to overcome the 'not-so-hungry' feeling. The school should exert a central role in supervising the mid-morning breaks for snacks and should make suggestions on what should be eaten. It would be valuable if schools could bring children and parents together to discuss this subject. An unexpected, but welcome, benefit of our research is that the survey has helped to bring teachers and parents together, and has increased their curiosity and awareness of the issues raised by it. As a result of it, they have begun to ask for instruction on the subject.

The importance of breakfast for the children can hardly, in our opinion, be over-emphasized, not only because of its probable effect on scholastic performance (Tuttle et al., 1954), but because it is likely to lead to poor eating habits throughout the day (Huenemann, 1972). It is clear that the common misconception of skipping it as a means of reducing weight should be dealt with when the subjects of food intake, energy balance and overweight are discussed.

The active participation of student dieticians in the design and carrying out of the present study has been of great importance. It has helped them to learn through practical experience the methods of field research in nutrition. It has shewn them the relevance of the questions asked to the daily implications of modern active nutrition education, and it has also made them realize the importance of the subject, and the keen interest in it by all the parties involved.

In conclusion, it is our belief that studies of this kind in schools may be of assistance in assessing nutrition habits and attitudes and at the same time be an educational tool through which alterations and improvements can be instituted. We plan to carry out similar surveys elsewhere, and we hope that our approach may be of use to others who are involved in other aspects of nutrition education.

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3.5 The Influence of School Lunch on the Reading Performance of Primary School Children in Brazil

by

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This work, involving professors from different units of the University of Campinas, is the result of questioning by a team of specialists interested in basic educational problems relating to government intervention in the area of supplementary feeding and particularly school lunches. There is much talk today about interdisciplinary research. Attempts to carry out such research are becoming more frequent, although few succeed in carrying it into effect. We have tried to devise a model which is appropriate for our research. We have involved scientists in our team who recognise that their own specialities cannot, in isolation, provide answers to practical problems. We feel that our work is important not only for the results themselves, but also for its interdisciplinary approach.

Our research had as its principle objective the investigation of the influence of school lunches on reading performance in the first year primary grades of public schools in the city of Paulinia. In deciding on this area of research, we were influenced by the large number of children who repeated grades, and by the high drop-out rates during the first year of primary school. We also wished to identify the reasons for this unsatisfactory situation, which have been a source of controversy. From a methodological point of view, the study was classified as experimental research in which school lunch was an intervening variable studied in interaction with the following antecedent variables: kindergarten, age, nutritional level, socio-economic level and reading level.

In Brazil, school lunches which are classified as a nutritional supplement, must provide at least 15 per cent of the nutritional requirements of the child, corresponding to the four hours the child is at school. In the state of Sao Paulo, the school lunch consists essentially of a basic meal, composed of processed food. It is approved by the Secretary for Education and is distributed by the Department of Student Assistance. It provides, on average, a total of 250 calories and 10 grams of protein. The results of various research studies on the causes of malnutrition all suggest that the problem of nutrition is related to the quantity and quality of the food ingested. Starting from the hypothesis that the protein-calorie quantity was extremely low, we sought to increase the proportion provided by school lunch to 30 per cent of the daily requirements. This was distributed in two stages: at the start of the school day, and after one and a half hours of activity. The protein-calorie grade thus ingested by the children during the period was 20 grams of protein and 550 calories. The children in the first year of the primary grade of the city of Paulinia were chosen on a random basis; the 2 groups formed received a school lunch corresponding to 15 per cent and 30 per cent of the daily necessities.

The dependent variable in this research was reading performance. We believe that much work that has been carried out on this in the past has had serious methodological weaknesses. We therefore designed and tested an instrument specially for our work, aimed at ensuring homogeneity in the dependent variables. With the aid of appropriate statistical techniques it was possible to analyse both the pupils' reading performance and reading readiness. The results showed the readiness as the factor that explained 37 per cent of the reading performance variability. Because of this, we isolated the readiness factor when we looked for the real effect of the school lunch.

The nutritional level was studied by measuring the weight, height and circumference of the cranium, arm, and skin fold of the triceps and subscapular of all the children during the months of March, August and November. This research analysed only weight in relation to age, and classified the children as nourished, over-weight, or undernourished (of first, second or third degree). It was found that the percentage variation between the different nutritional levels in relation to the type of school lunch did not change, and that the percentage of the nourished children remained at about 46 per cent.

Two different types of school lunches were analysed with respect to their relationship to nutritional status. The reading performance of children receiving one of the lunches (M2) was significantly better than the other group. Another significant factor was whether or not the children had attended a kindergarten. The second school lunch (M2) showed a significant relationship in the reading performance for children who did not attend a kindergarten and did not affect those who did attend it. We also found that, while the reading performance would be expected to be higher for those who received school lunch M2, this was not, in fact, a significant relationship, when we consider the age of these subjects.

Analysis of the relationship of different socio-economical levels with reading performance, shows clearly that there is a significant relationship with the levels of low income, when analysed in relation to both types of school lunches. These data show that, while the three lowest socio-economic levels increase when given school lunch M2, there is a slight tendency to reach the highest level. While we recognise that these results need to be more rigorously analysed, we believe that an adequate school lunch is a highly significant factor in reading performance. It is a factor not only in alleviating hunger, but also in improving the nutritional condition and cultural level of poorer children. It is important that the school lunch, nutritionally speaking, be totally adequate and not just a palliative, particularly in developing countries. It is important that we reconsider the real nutritional needs of children in these countries, on the basis of their nutritional needs.

In Brazil, our group is at present investigating and comparing this data with the results of the politics of the school lunch programme that is completely based on the use of local foods and related to the eating habits of each target region. We hope that together with this approach, formal and non-formal education in nutrition and health will create an awareness and help the poor population by working together with them.

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3.6 'Our Meals' - A Multidisciplinary approach to Nutrition Education in Israeli Primary Schools

by

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Nutrition education in Israeli primary schools is taught mainly in the fifth and sixth grades by qualified teachers. The Nutrition Education curriculum which has been designed by the Home Economics team in the Israeli Curriculum Centre (Curriculum Centre 1976) introduces the student to the main groups of food nutrients and emphasizes physiological and nutritional considerations. 'Our Meals', which is the next subject, aims to broaden the scope of nutrition education, and deals with personal, psychological, behavioural and cultural aspects of food, of nutrition and of eating habits. The main goals are:

- to develop the students' abilities to plan, prepare, serve and eat proper meals;
- to establish sound eating habits; and
- to arouse in the students an awareness of the importance of food habits and of the personal, the social and the cultural meanings and roles of food.

An Integrated or a Disciplinary Approach to Nutrition?

The choice of an interdisciplinary approach in developing learning materials for 'Our Meals' has been made for both teaching and nutritional

considerations. In curriculum planning there is a controversy between unitary or integrative planning (which concentrates around non-disciplinary subjects) and disciplinary curriculum planning. In practice, the choice is not simply between disciplinary and integrative approaches. Several intermediate approaches are possible, such as:
- limiting integrated courses to the lower classes of primary schools,
- partial integration by teaching several closely related disciplines,
- using multi-disciplinary teaching, which bridges the disciplines while retaining the distinctions between them.

In Israel, the unitary appoach was practised in Kibbutzim (Chazani, 1944) where it was used for many years, in both primary and secondary schools. However, in the general state school system in Israel integrative methods of teaching are used a good deal, especially in the lower classes (1-4) of the primary school. Nutritional subjects are occasionally taught in a rather unsystematic manner in grades 1-4.

Nutrition education, perhaps on account of its relevance to the complexities of daily life, is inherently inter-disciplinary in character. If it is conceived within a narrow disciplinary framework, important aspects and messages are liable to be neglected. Berg (1973) states that 'it is doubtful whether changes in food habits can be achieved by teaching nutrition as nutrition.'

Lewin (1942) investigated the psychological and cultural background of food habits. Since then, many nutrition education projects, designed for a variety of peoples all over the world, have shown clearly that even a generous supply of nutritionally perfect foods may fail to bring about the desired improvement of a population's nutritional status, unless the supplied foods, the recommended menu and the nutrition education programmes take account of the life-style and the 'mentality' of the target population. Ramsey and Cloyd (1979) surveyed the influences of social, psychological and cultural factors on the acceptance of desired nutritional changes, and they stressed the importance of an inter-disciplinary approach in such projects. Grivetti and Panghorn (1973) reviewed seven different approaches to research on food habits (environmental, cultural, clinical, etc.) and concluded that a combination of these approaches is essential for full understanding of food habits. Many nutrition programmes now follow this principle and place nutritional aid in the context of cultural, traditional, political and financial factors (examples: Tax 1957, Zimmerman and Munro 1972, Rody, 1983).

There are also many experiments of correlating nutrition education programmes in school with other subjects. Among these are: combination with reading enrichment programmes (Lowenburg 1978), use of folklore (Singer 1982) and planning nutrition-related environmental education activities within an integrated curriculum (Rye, Kolasa, Stonehouse 1977). Psychological and social aspects of food habits are also dealt with in nutrition education programmes designed for teachers (Mills, 1977). Two recent supplements of the Journal of Nutrition Education contain extensive reviews of multi-disciplinary trends. Examples include the proceedings of a workshop (Olson and Gillespie, 1980) which discussed the application of principles of the behavioural sciences to nutrition education and research

'Food-Custom and Nurture' (Wilson, ed., 1979) is an annotated bibliography covering subjects such as the folklore and history of food, as well as biological, ecological and geographical aspects of the subject.

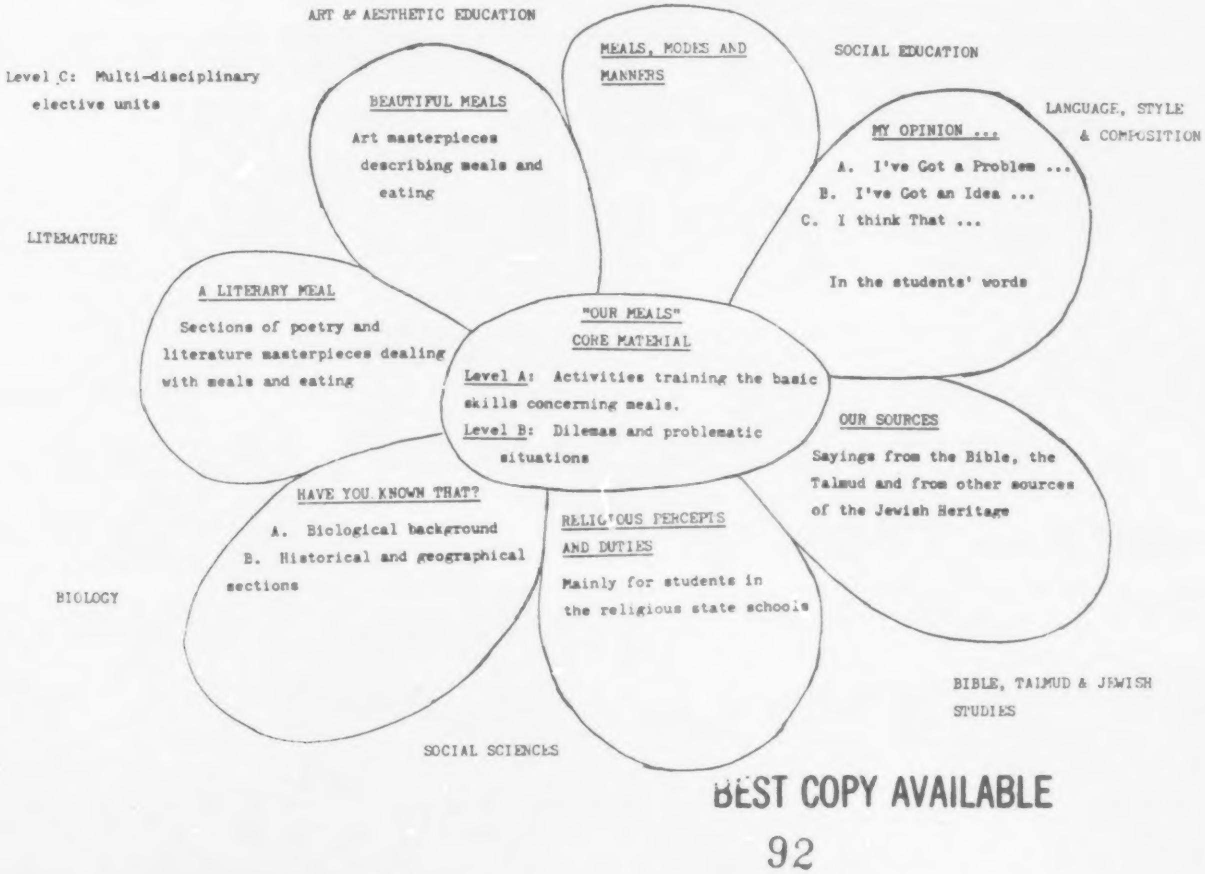
In conclusion, both educational and nutritional factors point to the desirability of adopting an inter-disciplinary approach. At the same time curricular limitations suggest that there is some merit in teaching nutrition as a subject in its own right, provided that it can be correlated with other disciplines in a meaningful way.

The Development of Learning Materials for 'Our Meals'

The guiding principles we adopted in developing multi-disciplinary learning materials for 'Our Meals' were as follows:

- the multi-disciplinary approach should be based on a sound theoretical and practical knowledge of nutrition. 'Our Meals' is therefore designed to follow 'The Nutrients in Our Foods'.
- the materials should be organized in compartments so as to permit adequate 'mapping' of the subject and the distinctions between the disciplines should be clear to both teachers and students,
- each item selected should have a meaningful relevance to nutrition and food habits,
- the selection should be done in co-operation with individuals of the relevant disciplines, and should make a contribution both to nutrition education and to the whole curriculum,
- the core units should stress mainly nutritional issues, and include a little multi-disciplinary material, and
- the elective materials should be varied and appropriate for a wide range of levels.

Figure 1 The Multidisciplinary Approach to 'Our Meals'
(The Flower Model)


ART & AESTHETIC EDUCATION
Level C: Multi-disciplinary elective units
BEAUTIFUL MEALS
Art masterpieces describing meals and eating
MEALS, MODES AND MANNERS
SOCIAL EDUCATION
LANGUAGE, STYLE & COMPOSITION
MY OPINION ...
A. I've Got a Problem ...
B. I've Got an Idea ...
C. I think That ...
In the students' words
LITERATURE
A LITERARY MEAL
Sections of poetry and literature masterpieces dealing with meals and eating
"OUR MEALS" CORE MATERIAL
Level A: Activities training the basic skills concerning meals.
Level B: Dilemas and problematic situations
OUR SOURCES
Sayings from the Bible, the Talmud and from other sources of the Jewish Heritage
HAVE YOU KNOWN THAT?
A. Biological background
B. Historical and geographical sections
RELIGIOUS PERCEPTS AND DUTIES
Mainly for students in the religious state schools
BIOLOGY
BIBLE, TALMUD & JEWISH STUDIES
SOCIAL SCIENCES

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The general scheme, which we call 'The Flower Model', of the multi-disciplinary materials developed for 'Our Meals' is shown in Figure 1.

The Future

Most of the elective learning materials have now been produced in a preliminary edition, and have been introduced mostly to professional nutrition educators. The materials have been warmly received, but it is apparent that there are several difficulties in using them. These include lack of time, lack of self-confidence by the teacher in handling materials of other disciplines, and the fear of invading other teachers' territories. Some of the material has been readily accepted by curriculum developers of other disciplines, and there are now plans to introduce them to other teachers. There is a need for carefully-planned teacher education courses which will deal with the use of these materials and encourage co-operation between different teachers of the same class. Our hope is that the scheme will help to improve the quality of nutrition education, and of education generally, through inter-disciplinary collaboration.

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3.7 Nutrition Education in the new Nuffield Home Economics Project

by

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Nutrition is perhaps one of the more difficult areas in which to apply the Nuffield approach to teaching. Its messages are not readily revealed by simple laboratory experiments which can be carried out within the time-span normally available for teaching pupils in the 14-16 age range. There is a further difficulty brought about by the concern that nutrition education should lead to the adoption of sound dietary practices at each stage - both in the short and the long term. It is also important that a coherent nutrition message is conveyed at all levels. The selection of topics to meet criteria such as these may require teaching particular topics before pupils can understand all the complex science underpinning them.

The aims of the Nuffield Home Economics project included recognition of the importance of pupils being involved in activities which would generate ideas for the resolution of problems and to evaluate these through practical application. (Nuffield Home Economics 1982a). It was felt that the methods of science should be used as a starting point for learning in Home Economics. The mounting of a major Home Economics project provides a valuable opportunity to carry out an analysis of nutrition teaching in secondary schools and to evaluate innovatory approaches.

Preliminary analysis of teaching schemes and examination syllabuses used in this country led the project organisers to the conclusion that in many Home Economics courses, subject content (amounting to facts, theories and concepts) was emphasised at the expense of experience of the processes of learning, and that this was reinforced by existing examination procedures (Nuffield Home Economics 1982a). But in the published Nuffield Home Economics materials, presentation of content is through means which involve pupils in clearly identified processes of learning. Naturally, this approach cannot be used in teaching all topics. However, the learning processes are intended to develop skills which should help pupils to acquire new knowledge and assess evidence; in other words, to continue the educative process beyond the school setting.

Table 1

Processes of learning	Skills to be developed by pupils
OBSERVING (Mapping the field)	Data collection including library resources (broad field) Measurement and estimation Early detection of patterns Selectivity in observations (narrow field)
ANALYSING (Processing data)	Classification and interpretation of data Identification of patterns Formulation of questions (cause and effect associations) Framing of hypotheses
PLANNING and carrying out investigations (hypothesis testing)	Selection, drafting and implementation of methodologies Selection and use of equipment and materials Practical skills Selection of criteria for measurement Recording of results
ASSESSING (Applying critera)	Assessment of accuracy and significance of results, quality of end-products and validity of conclusions
COMMUNICATING (Sharing findings)	Organisation and presentation of findings Verbal (including oral) and mathematical (including graphical) expression
APPLYING KNOWLEDGE (Modifying behaviour)	Relating of new knowledge (findings of investigations) to existing precepts and practices Use of knowledge gained to further understanding (of fundamental concepts) Use of knowlege gained to enlighten decision making (enlightened practice of Home Economics)

Six processes of learning were identified, together with associated skills, as summarised in Table 1. The order of presentation of the six processes of learning is significant in that it traces a route for a classical application of scientific method. It should, however, not be assumed that pupils are invariably required to follow the whole sequence; rather processes and skills are employed selectively as appropriate for the materials. The terminology employed is that of science and could prove a stumbling block. This has been recognised in the preparation of publications which include both Pupils' Texts and Teachers' Guides. In the latter, the substance of Table 1 is presented and explained and, in the commentaries on Pupils' Texts, instances are cited for implementation of the six Processes of Learning. Assessment tables likewise point to means of testing development skills, thus allowing both formative and summative assessment of pupils, appropriate for this style of teaching.

Table 2 Nuffield Home Economics Project Materials

Basic Course	
PUPILS' TEXT	one book comprising four sections: Food Science, Nutrition, Fibres and Fabrics, People and Homes.
TEACHERS' GUIDE	one book covering each of the above sections
OVERHEAD PROJECTOR AND WORKSHEET MASTERS	set of 45 cards
Second Phase Courses	
PUPILS' TEXTS	four books, one for each of Fibres and Fabrics Food Science, Nutrition, People and Homes
TEACHERS' GUIDES	one for each Pupils' Text
OVERHEAD PROJECTOR AND WORKSHEET MASTERS	one for each Pupils' Text

The Basic Course (see Table 2) is intended for pupils in secondary schools following a non-selective curriculum, which usually operates for the 11 - 14 years age band. The current challenges for curriculum planners have been faced, i.e. demands for materials equally suitable for both boys and girls from multi-ethnic communities and for methods feasible for mixed-ability teaching. The advantages of introducing nutrition studies within the context of Home Economics comes from pupils' knowledge and practical skills related to foods, meal preparation, family life-styles, family budgeting and child care. The expectation of a concurrent study of science requires a collaborative approach to curriculum planning, although there are no precise pre-requisites for pupils following the Basic Course.

The Second Phase Courses are intended for pupils following selective subject courses in the 14-16 age range. It would be possible for some or all of the four courses to be pursued. Cross referencing between pupils' texts allows reinforcement or extension of ideas, but there is no sequencing requirement. It would be helpful but not essential for the Basic Course to have been followed prior to the Second Phase Courses. The difficulty of prescribing concurrent science studies is acknowledged, and there is no dependence on particular prior attainments. Nevertheless, there are abundant opportunities, which are clearly indicated, for drawing on relevant science studies and requirements for the practice of both literary and mathematical forms of expression and manipulation.

The Second Phase Course in Nutrition

In the selection of content, the editors (Barbara Lake and Robin Osner) were mindful that no one is wholly ignorant of nutrition, for everyone is a practitioner. Likewise, they were concerned to promote further the messages of the Basic Course Nutrition Section, regarding the range of dietary practices shown to be conducive to health and the variability in nutritional requirements of individuals (Nuffield Home Economics 1982 b). They have sought to extend nutritional knowledge by cumulative means and to aim for behavioural outcomes by modification rather than displacement of existing practices.

Necessary limitations on length commended adoption of the Dietary Guidelines/Goals approach, with its emphasis on contemporary nutritional concerns. Not only did it provide a rationale for the content, but the grounds for the selection of guidelines and the means used for their promotion are appropriate material for investigation and assessment; indeed for exercise in the processes of learning detailed in Table 1.

It was decided that the course should begin by increasing self-awareness in pupils concerning their dietary practices, their behavioural responses to feeding (and drinking) stimuli and habit formation. The methodologies invoked are those of the dietary survey and the qualitative investigation of the constituents of foods. Nutrients selected for study are those with readily discernible physical properties (viz fats, sugars, salt and dietary fibre) and concerning which there are widely accepted Dietary Guidelines (or Goals). Data available for reference and manipulation is from Food Composition tables and reports of the National Food Survey Committee. Physiological rather than bio-chemical aspects of food utilisation are covered, confining attention to functions of which there is conscious awareness, for example ingestion, and the implications which they have for food intakes. Concern for water balance leads to consideration of infant feeding and the grounds for the promotion of breast feeding.

The concept of energy is attempted in the second section, with the attention appropriate for its importance in relation to estimation of food allocations and the problem of obesity. Recommendations regarding intakes are considered, their derivation and appropriate applications. The underlying concept of representation of a group by an average man or woman requires attention to the factors from which variations arise. Altogether, this section requires more of teachers and pupils than the concrete approaches of the first section.

The third section turns attention to those nutrients, with less manifest properties, for which account must be taken in a dietary prescription. The final sections deal with exceptional dietary requirements and with postulations regarding the future and its emergent Dietary Goals and Guidelines.

Implications for Course Implementation and Evaluation

Compilation of course materials has taken account of teachers' responses to draft materials. Responses to published Basic Course materials have come from a structured dissemination programme of seminars and workshops covering most of the United Kingdom.

A prominent concern is with the curtailment of content resulting from time consuming pupil-centred activites. Expectations of examining bodies are held up as insuperable obstacles. Obviously for courses for pupils from 14 - 16 years, there are implications for revision of examining strategies. In preparation for this, each chapter is furnished with a model assessment card, produced as a Worksheet Master.

For teachers involved in the project, lesson preparation proved particularly onerous. Participating teachers obviously needed ancillary help on a par with laboratory technician provision. In-service training, more especially in workshop sessions, could increase confidence and appreciation of the teaching potential of practical investigations. A lot of confidence is needed to draw inferences from unexpected outcomes and yet it is central to a scientific approach.

A pilot enquiry into teachers' expectations of project materials, undertaken with a view to constructing an instrument for evaluating the second phase course in Nutrition, revealed the deeply-felt need of Home Economics teachers for help in keeping up-to-date. The editors of the project contend that the approach taken lends itself to the continuous up-dating of content. The presentation of a body of knowledge is replaced by the posing of questions, the answers to which will reflect at least some of the changed circumstances behind any necessary re-appraisals of nutritional messages.

A full-scale evaluation of the second phase Nutrition materials will doubtless depend upon availability of funds. Prominent amongst the criteria must be whether use of the materials results in pupils generating ideas for practical approaches to the resolution of nutritional problems and for the inculcation of skills necessary for their implementation.

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3.8 What's in a Word? - students' alternative frameworks

by

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All teachers recognise that much classroom teaching is ineffective and that pupils misunderstand or forget much of what is taught. Poor learning has many causes. Firstly it will be worthwhile to examine briefly a common view of the way that learning is supposed to occur. The teacher decides what the subject of the lesson will be: the lesson is then 'given', the teacher doing much of the talking, the learners sitting quietly, perhaps taking notes. Exercises and activities of various forms may be set to reinforce the learning. Discussion, if it occurs, is usually teacher-directed. The child's mind is expected to absorb all that has been put before it. The teacher expects this mind to be empty of the content of the lesson - a tabula rasa. However, all teachers know that retention and understanding will not be 100 per cent for any individual in a group and ' poor memory' has become part of teaching folklore.

It is recognised that within this model some good learning does take place, but in nutrition as in any subject, learning is often far from efficient. This is shown by, for example, low technical competence in food selection, which is not only emotionally related. Recent research also indicates that greater attention needs to be given to the understanding and prior knowledge that children bring to the classroom situation (Watts 1982).

My own research has been into the ideas, embodied in nutrition terms, which are held by school pupils. Initial studies indicate that children's ideas on particular topics are far from the scientists' view. The effect of formal instruction cannot as yet be quantified, but I have found instances where instruction has had little obvious effect.

By virtue of current practice, it seems that teachers feel that these misconceptions will disappear when the 'right' notions are taught. The errors will be subsumed in some way under the new teaching. However, there is now a vast literature which shows that this is not the case. Even though learners may use scientific words, they cling tenaciously to their own ways of explaining things and events. They have alternative systems of thinking which have made sense to them during their contact with the world. Ausubel (1968) has described these 'preconceptions (as) amazingly tenacious and resistant to change'. He was using 'preconceptions' to imply pre-instructional ideas. But it is now clear that pupils, including undergraduates, often stick with their intuitions even when they have the requisite thinking skills or processing strategies to overcome them. In fact it is likely that teaching which ignores misconceptions, or alternative ways of viewing the world, may make them more elaborate and stable instead of extinguishing them.

Teachers have known in a vague way about this problem for a long time. Studies of misconceptions in science have a long history, perhaps originating with Piaget's studies of children's ideas of the world (Piaget 1929). But it is only in the last ten or so years that concerted efforts have been made to isolate some of these misconceptions and to restate the position. No longer are they viewed as errors, misconceptions or even pre-conceptions, but as ideas in their own right. To the learner they have real meaning and utility: they are not 'erroneous' notions. 'Alternative Conceptions' accords a status to these ideas which is not implied in the earlier terminology.

An explanation of how such frameworks could arise might be found in the current debate in the philosophy of science. Briefly it is suggested that instead of scientific theory proceeding via a process of induction from the observation of objective fact, we normally proceed differently. Hypotheses (or theories) are constructed out of human imagination and are tested against facts that are observable via the observer's constructions.

There is a strongly held conviction that all people are scientists, in that we all strive to make sense of our world through our experiences of it. The hypotheses that we generate are tested for efficiency and predictability in our dealings with things and events, and thus our personal constructions are formed. Children working in this fashion produce the alternative interpretations seemingly as products of their imaginative efforts to explain events and to abstract patterns from them. These alternative frameworks, whilst in keeping with a learner's experience, may be seen as being inadequate or of limited scope.

The implications for teaching are enormous. We are asked 'to start from where they (the learners) are at'. Where is this? What frameworks are held by the expectant listeners? In some areas of physics, studies have suggested that generalised frameworks may exist (Gilbert 1982). But given that individuals must hold unique constructions, application of such generalisations to individuals must be treated with caution. In nutrition advertising too appears to be significant.

The following are instances of alternative frameworks in nutrition: fried foods are bad foods, meat and vegetables are good foods as long as they are not fried. I suspect, too, that formal instruction can generate alternative frameworks. Teachers are, after all, following syllabuses which attempt to encapsulate subject matter according to the available time. Pupils receive little instruction in nutrition during the first three years of secondary school, and that may be the only nutrition education they receive, unless they are studying home economics or biology for the 16+ examinations. Thus they will have experienced the subject only during a period when they are unlikely to have developed the mental frameworks required for making abstractions.

In order to accommodate this difficulty, there has been a history of simplification in school nutrition education. For example, children are taught that certain foods provide energy, other foods are needed either for body-building and repair or for protection. Often there is no cross-classification 'because it makes operation of the system too complicated'. Systems such as this seem to be a legacy from the days of nutritional deficiencies or food shortages rather than a means for choosing a healthy diet. Statements of the function or chemical nature of food components are still widely used in schools, adult education and advertising material for teaching meal planning. The advent of dietary goals has displaced them in very few circumstances.

In my research, I have found instances where children choose foods soundly without recourse to such 'food function' or 'nutrient' systems. More importantly I have found several instances where the use of such devices has led to considerable overt confusion in the learner who is trying to reconcile a more precise understanding of nutrients with the earlier views. Also it has not often led to sound meal planning. This kind of device could be referred to as curriculum science, an attempt within the developmental patterns of the learner to bring them closer to the scientist's view of science. Curriculum science acts, it is hoped, as an intermediary between children's science (alternative frameworks) and scientist's science (that which is socially negotiated).

It is not easy to overcome alternative systems of thinking. Cognitive conflict, where pupils have to confront different points of view and note the outcomes, has proved beneficial in some circumstances. Informal discussion in small groups where the learners' own views are aired may also be important. But restructuring of thought will not take place unless the individual is convinced that the new framework will give a better solution and that it will solve related problems.

Thus curricular science should be structured more to meet the demands of the learner if it is to move them towards scientists' science. These demands are seen as the alternative frameworks. In the early seventies, well before the publicly stated dietary goals, grave doubts were expressed about the utility for learning of the current simplifications (Finch 1974). I suspect that these simplifications have often resulted not in a move towards sound practice, but in the creation of another set of alternative frameworks.

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3.9 Nutrition Education as Viewed in the Context of Science Education

by

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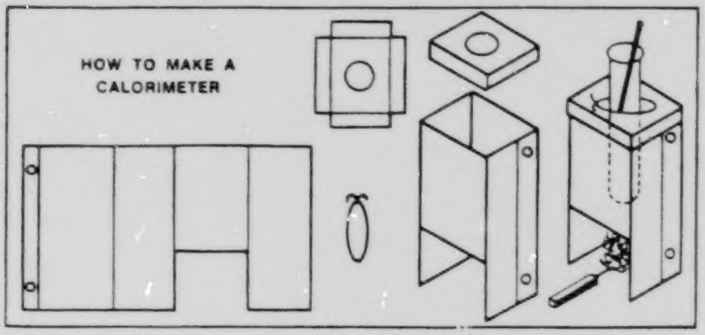
For a long time I wore the hat both of a Professor at the Medical School and a leader in the innovation of science education at lower school levels. In the context and priorities of the Third World, we were trying to harmonise the goals of science education with real life problems. There is nothing, I believe, more necessary than to bring together nutrition and health education with science education. Later, I spent a decade in the United States of America, where I enjoyed trying to bring about the same marriage. I would like to review here the basic approach, as well as some of the problems and doubts I experienced.

The science education innovation movement launched in the sixties (in Brazil it began in the fifties) resulted from the initiative of active scientists who were concerned with the impact science was making on society in the post-war period. We were concerned that the science taught in schools was not really science education or even science, but solely the transmission of definitions and statements of 'official dogma'. By contrast, we wanted students to learn how to obtain scientific evidence, how it is evaluated and interpreted, and how conclusions need to be continuously challenged, re-evaluated and extended. Furthermore, science education should not reflect just the body of knowledge of the beginning of the century, but also the excitement of today's science, and its impact on mankind. Although we did not expect all our students to become scientists, we aimed to educate the laymen to use the rational approach of science in their decisions.

The aims of nutrition education, and we should stress education, are essentially the same as these. We should transmit not just the official dogma (while allowing for alternative ones), but provide evidence, and indicate how this evidence is obtained, in order to be accepted and incorporated in the behaviour of the learner.

Most of our science education activities in Brazil that include nutrition education were for 3rd - 9th grades. Its basic purpose was to guide youngsters to perform simple experiments, using simple low-cost equipment (Figure 1). This enabled experiments on the chemical nature of food and living things, including some experiments in nutrition, using plants, house-flies and fruit-flies (Drosophila - small, simple to maintain and inexpensive) to be carried out.

Figure 1 Example of low cost apparatus designed by Funbec



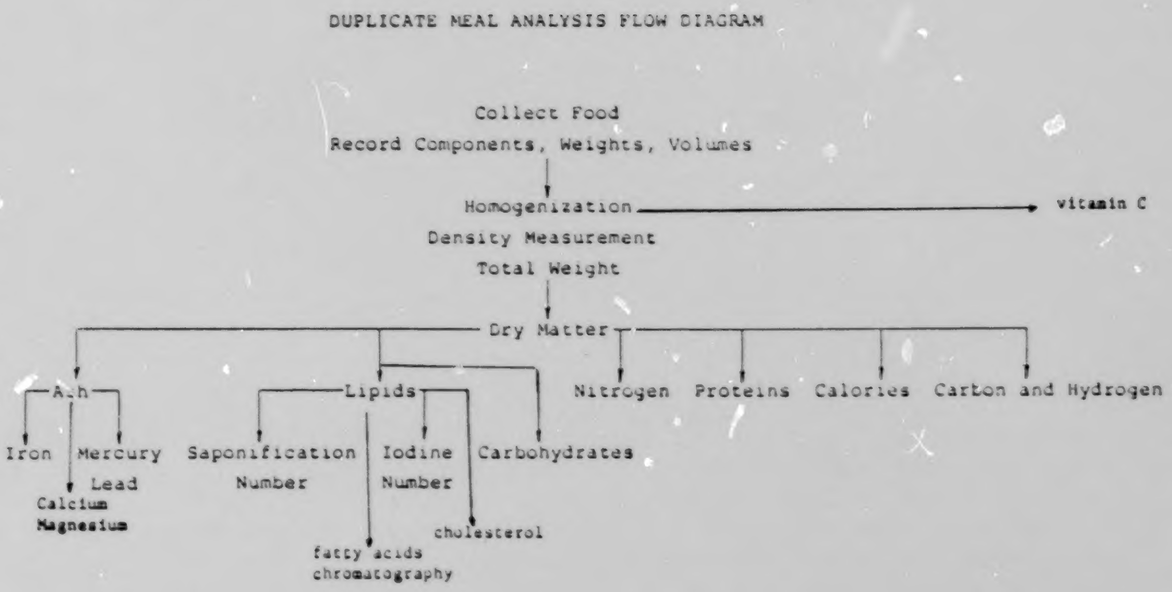
The basic idea was first to introduce such equipment to the youngsters who want to perform experiments independent of the schools and, at the second stage, to introduce it into the schools.

The kits are designed in such a way that they can be sold on news-stands, and everything that is required is inside, including a scale, for example, and a little booklet which explains how to do the experiments, but which does not draw conclusions or state what has to be found out - the students have to learn from the experiments. There is a series of about eight of those in nutrition. The commercial form looks slightly different, more 'fashionable'. At one time in Brazil, depending upon the series, these kits were sold in quantities of up to 250,000.

Most of the material was transferred to regular textbooks and is being used in schools. The Foundation which I direct prepared the material. It is a non-commercial institution that has made avilable the equipment and sells it to the schools. There is a large variety of materials related to nutrition and to health which is being implemented in Brazilian schools by texts, some non-commercial texts prepared by the Foundation, and some commercial texts written by other people - but once the model is available, it spreads everywhere and those materials are being used in schools. Also, some experiments are performed in the schools through the year - not as many as we would like, but some.

Our North American experience was in inner city areas with students who were not motivated towards science. For them, nutrition was much more interesting than science. We devised a project in which students collected a complete duplicate sample of their own meals for one day, and spent a term analysing it (Figure 2).

Figure 2 What people eat


DUPLICATE MEAL ANALYSIS FLOW DIAGRAM
Collect Food
Record Components, Weights, Volumes
Homogenization
vitamin C
Density Measurement
Total Weight
Dry Matter
Ash
Lipids
Nitrogen
Proteins
Calories
Carbon and Hydrogen
Iron
Mercury
Lead
Calcium
Magnesium
Saponification Number
Iodine Number
Carbohydrates
cholesterol
fatty acids chromatography

The project required only conventional laboratory equipment and a simple low-cost calorimeter for carbon-hydrogen analysis (Raw et al., 1974). Using an experimental guide (Raw et al., 1976) students initially produced a dry homogenate that was stable. They conducted fat, ash, carbon-hydrogen, protein, calories analyses, and could pursue them as long as they wished, according to their interest. At the same time, they had a text that demanded reasoning, performing some other simple experiments and allowed self-evaluation (Raw et al., 1975). They also received two rats, which they maintained on a diet of their choice, and compared the control and diets of the other students. In each group, a few students used either single food diets (frequently corn) or diets that reflected the nutritional habits of an ethnic group. The observation that the rats fed on corn were small and nervous stimulated discussions on the problems of malnutrition of children, and its social causes and consequences. If the rats were fed some succotash (beans and maize) of the Indians, or the rice and beans of the Brazilians and Cubans, these turned out to be quite good diets, and the rats grew normally. If the diet is changed (to a good diet), the rats grow very fast, but they never catch up with the other rats which were well fed from the start - which reflects what actually happens in the developing world.

A modification of this approach was used with medical students who also developed an interest in this work (Raw, 1977). All three projects succeeded in arousing interest in students, and in making science and nutrition come alive. All too often the work stops here, which is amazing when we consider the achievements of science: men are in space, computers which allow us to play, write and calculate, lasers which reproduce music.... As educators, we must admit that all our educational effort has a limited impact for the great majority of students. Most people operate in their daily life by the traditional culture, but even some of the sophisticated students continue to accommodate the capability of reasoning and using information made avilable as science with a non-scientific culture, which they use in their real life. This schizophrenic duality that exists in most students and young adults is a challenge to all our educational efforts.

This problem is even more important in relation to nutrition and health habits. Although all health specialists are aware of the profound influence of the traditional culture in influencing nutrition habits, it is disappointing that young people born and raised in the midst of technological Western culture have created and absorbed a para-scientific culture, which is not unlike the traditional culture of the developing countries. It is this para-scientific culture which has a major effect on nutrition behaviour, and its only rival is not the sound, documented scientific information available, but the impact of advertisements.

'Fads' may cause intelligent, educated people to exchange their traditional nutritional habits and accept, without challenging, all sorts of unsubstantiated claims. Advertisements led many to abandon coffee for caffeine-free coffee, while they consumed the same caffeine in their soft drinks; now people even obtain the same 'lift' on a caffeine-free soft drink!

It must be admitted that non-school processes have been remarkably effective in bringing about behavioural changes, and that traditional education has so far failed to do so.

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CHAPTER 4

THE PREPARATION OF TEACHERS

There is a sense in which all those who engage in communication are educators. This broad definition of education is reflected in the scope of this chapter which encompasses the preparation of teachers and research workers at all levels. Undergraduate courses in nutrition and food sciences are examined by Richard Orraca-Tetteh and Anne Walker; many of those pursuing such courses will become the nutritionists and university lecturers of the future who will exert a powerful influence on the direction of nutrition education in the coming decades. Others may enter the teaching profession as secondary or teacher educators, or become involved in community and health work. Since university education exerts such a powerful influence on what is taught in schools, it is important that the nature and content of university courses should be related to the needs of schools and the community. The papers by Marlene Hamilton and by Doreen Parry and Mary Cursiter examine the place of nutrition education in teacher education. The survey carried out by students in Edinburgh is an interesting example of an active approach to learning about nutrition which could well be used more widely.

The importance of preparing primary school teachers to teach nutrition in a world in which the majority of children receive no secondary education can hardly be overestimated. It is vitally important that nutrition should have a secure place in the primary school curriculum. At present, the majority of primary school teachers receive little or no training in science or nutrition. It is therefore only natural that many of them lack the confidence to teach these subjects. It is a matter for regret that there was not a wider discussion of the preparation of primary school teachers during this conference, but David Kiyimba's paper provides a refreshing account of the Namutamba Project in which nutrition education occupies an imnportant part of the teacher training programme.

The provision of inservice training courses in nutrition education is of vital importance. Such inservice courses enable teachers to increase and up-date their knowledge about nutrition and to extend their professional skills. They also provide opportunities for developing low cost resource materials which are invaluable, particularly in places in which there are no centres of the type described by Marcienne Darras in Chapter 5. The paper by Salah Mahgoub, on recent trends in nutrition education in the Sudan, provides a link between the preceding papers and those by Barbara Purvis and Kalyan Bagchi which consider the important issue of training of agriculturalists and community health workers.

Contributors

4.1	Richard Orraca-Tetteh	Nutrition education at university level
4.2	Ann Walker	Nutrition education for food scientists

4.3	Marlene A. Hamilton	A survey of college-level nutrition education programmes in Jamaica
4.4	Doreen Parry & Mary Cursiter	Learning by doing - student participation in nutrition education surveys
4.5	David Kiyimba	The place of nutrition in teachers' curriculum as a tool for rural development
4.6	Salah E. O Mahgoub	Recent trends in nutrition education in Sudan
4.7	Barbara Purvis	FAO experience on methods of introducing nutrition in schools and colleges of agriculture
4.8	Kalyan Bagchi	Nutrition training of community health workers

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4.1 Nutrition Education at University Level

by

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Early Education in Nutritional Science

Education in Nutrition has had a chequered course over the past century. From the period when what can be called the scientific enquiry into the metabolism of the human and animal bodies by Carl Voit to the present when the relationship between diet and disease seems to hold sway, much has emerged in the field of nutrition. In those early years, scientific works in areas of chemistry, physiology and medicine spent a period of apprenticeship in the laboratories of the master scientists. Thus Carl Voit learnt his chemistry in the laboratory of Justus von Liebig, the German chemist. From such beginnings as these there emerged the methods by which the early nutrition scientists were trained. Graham Lusk, Gowland Hopkins, Karl Thomas, Thomas Osborne, and many others learnt their science of nutrition in this way. These early pioneers carried out basic and fundamental studies which provided data on the physiological and biochemical aspects of nutrition. Such studies established the place of nutrition science among the sciences.

These early nutrition scientists trained many others in the methods of nutrition research. Most of these trainees had already acquired degrees in various sciences and were thus graduate workers. This type of training of graduates from a variety of other disciplines in nutrition thus became the norm by which education in nutrition at the university level was carried out.

The education of graduates from a variety of different disciplines in nutrition still continues to this day, but with several modifications. Graduate students now take courses in related subjects such as biochemistry, physiology, biometry, in addition to those on nutrition. Such courses prepare and orientate the graduate student to nutritional science. On completion of these courses and their qualifying examinations, the student can now carry out a research project. Research projects chosen by such graduate students may be on various aspects of nutrition, such as metabolism of nutrients, biological assays of protein or other nutrients, or the investigation of the nutritional status of a community. From such research projects are prepared dissertations for examination for higher degrees.

Undergraduate Education

Undergraduate education in nutrition can be traced to the colleges where Domestic Science or Home Economics were taught. Traditionally, courses in food and nutrition are part of the training of home economists. In the United States of America, where home economics schools were part of the Agricultural Colleges, courses in foods, cookery and meal planning, and the utilisation and metabolism of food components were provided for undergraduates in addition to other Home Economics courses. Specialisation in food and nutrition was provided in the Home Economics programme. This led to the various specialisations in either dietetics or nutrition. Thus, for a long while, schools and colleges of Home Economics were the home of training of workers in food and nutrition.

As a result of the discoveries of prominent research workers, the great importance of nutrition to the health of the individual, the community and the nation became recognised, and independent departments of nutrition, food and nutrition or nutritional sciences were established. These departments provided courses in nutrition for the undergraduate student in science. Undergraduate training in nutritional science also started in many developing countries. In Africa south of the Sahara, the first of such departments was established at the University of Ghana in 1962.

The course structures for undergraduate work in nutritional science vary from university to university. Generally a good science background in the physical and biological science is required in order to be enrolled in the nutrition courses. The basic nutritional courses provided for the undergraduate are in the areas of nutritional physiology, metabolism of nutrients, nutrient requirements and their determination, energy and energy requirements, nutritional needs of vulnerable groups, assessment of nutritional status, diet and disease, nutrition education, food and food values, social factors, food habits and their influence on nutrition, applied nutrition, population and food resources. These basic nutrition courses may be supplemented by other courses such as world food and nutrition problems and food and nutrition policy. Laboratory and field experiences are provided to elucidate the theoretical courses. A mini-research project is also carried out by each student.

Graduates who undergo training in nutritional science by following this type of course emerge to become what might be termed 'general' nutritionists. They do not have any specialisation in the various branches of the subject, and thus cannot be expected to be experts in the field.

Nutritional science has several recognised divisions which, unlike other subjects, have not been clearly delineated for specialisation (Orraca-Tetteh 1980). Examples of such areas include: nutritional biochemistry, clinical nutrition, public health nutrition, nutrition education, applied nutrition, nutritional anthropology, and food and nutrition planning. These areas of specialisation must be provided for in both undergraduate and graduate education. Some of these areas - such as public health nutrition, food and nutrition planning, and nutritional biochemistry - are already included to some extent in graduate nutrition training. It is significant that in countries where these specialisations in nutrition have not received much attention, nutritionists with undergraduate training are called upon to be applied nutritionists, public health nutritionists, community nutritionists, nutrition biochemists and nutrition educators.

Nutrition Education

Nutrition education as a speciality in nutrition needs to be properly developed to provide the necessary training for the nutrition educator. It has often been wrongly assumed that a graduate in nutrition has the necessary background to be a nutrition educator. Education in itself is a specialised area in which various skills, knowledge and techniques can be acquired to equip the educator. In nutrition education, which is intended to influence the consumer, the need for specialised knowledge is even more urgent. As Bosley (1976) says, 'The fundamental objective of education in nutrition is to help individuals to establish food habits and practices that are consistent with nutritional needs of the body and adapted to the cultural pattern and food resources of the area they live in.'

In order to understand the need for the proper training of the nutrition educator, it is pertinent to ask what is meant by the term 'nutrition educator'. Several viewpoints have been expressed on this, but one which reconciles most of them is given by Gift, Washbon and Harrison, (1972), who state that many people can be classified as nutrition educators. 'Some are specifically trained professional nutrition educators - the dietitian, the nutritionist, the teacher of college level courses in human nutrition, the nutrition scientist with public service commitment. Others receive formal training in nutrition, but only as one part of a broader professional focus. Examples are physicians, nurses, health educators and home economists, including the home economics teacher. Still others who contribute to nutrition education may not have had any formal nutrition training: parents, social works, teachers in elementary and secondary schools, writers of popular publications on nutrition, paraprofessionals in the allied health fields, advertisers.' This statement clearly shows the role of the nutrition educator in what really is a matter of concern to every human being, the subject of food.

Examination of the university level nutrition education given to 'trained professional nutrition educators' clearly shows that undergraduates and graduates who have taken courses in nutrition are ipso facto nutrition educators. Harper has pointd out that there is 'both a science and a practice of nutrition and the same word is used for both.' (Harper 1969). He has also indicated that nutrition education is a part of the practice of nutrition (Harper 1979). Thus it becomes necessary for the nutrition educator who influences other people's nutritional practices to possess competences in addition to a social knowledge of nutrition. These include areas such as social science, communication, education and educational methods. The range of pertinent areas of knowledge required of the nutrition educator is extremely wide and can hardly be accommodated in one programme. But the aim should be to let the student appreciate the multidisciplinary nature of the subject of nutrition, which, in affecting health, has ramifications in the social, cultural, political and economic life of individuals and communities.

Fortunately some undergraduate and graduate specialisations in nutrition, such as public health nutrition, applied nutrition, dietetics, do provide some of these necessary skills and insights, but this varies both in different university institutions and in different countries. In both developing and developed countries, the increasing problems of food and nutrition require efforts to be made to provide a cadre of nutrition educators who can help in the attack on undernutrition and other forms of malnutrition found in the community.

Evaluation and Research in Nutrition Education

Nutrition education at the university level provides the personnel to occupy responsible positions in the field of food and nutrition. Public health nutritionists, applied nutritionists, nutrition educators and so on, have all been trained in university-type institutions to enable them to perform their roles in the community. Thus the success of nutrition education in universities can be measured by the way in which they carry out their work in the community. Evaluation of the effect of nutrition education in the university should be an important function of university level nutrition educators.

It is pertinent to enquire whether graduate nutritionists in their various spheres of work have had any influence on the food and nutrition problems in both developed and developing countries. The large variety of processed food found in most developed countries entices people to eat more and more food. There is also the availability of labour-saving devices in the home as well as readily available means of transport. These two factors all too easily lead to the intake of food in excess of the energy requirement of the human body. Such situations can result in the accumulation of large stores of body fat which cause excessive increase in body weight. Thus increasing obesity is one of the nutritional problems of developed countries. Can the nutrition educator in a developed country be sure that the nutrition graduates produced over the decades have had some influence in helping to combat this problem of obesity? Similarly, can nutrition educators in developing countries show how effective their graduates have been in combating protein-energy malnutrition in children?

Some evaluations seem to indicate lack of success in dealing with many nutritional problems.

An immediate question which arises is whether the conventional training of nutrition educators, public health nutritionists, applied nutritionists and so on, is suitable for dealing with these nutritional problems. In most developing countries, the problem of malnutrition is associated with various other factors, such as poverty, lack of the right kinds of foods, and the influence of various cultural practices. It is evident that the nutrition educator can have little impact on the problems of malnutrition unless he or she possesses other skills in improving the lot of the people in the community. Effective training in nutrition in the university should include field exercises which bring students face to face with the problems of their communities. In Ghana, the Department of Nutrition and Food Science in the University of Ghana has made it obligatory for students studying nutrition to spend two weeks doing field work in a village community. In this project, the students collect data on population characteristics, income and expenditure patterns, food production, and food purchases and amenities such as the source of water and sanitary and health facilties. Anthropometric measurements, biochemical studies on blood and urine, and clinical examination to detect overt signs of malnutrition are performed on as many subjects as possible. In addition a dietary survey of seven days' duration involving the weighing of all food consumed by a few families is carried out. In this way, the student comes to observe at first hand the food habits, intra-family food distribution patterns and infant feeding practices. Various constraints affecting such village communities in their daily activities become evident to the student. Analysis of the data is carried out later by the students.

An attempt to improve the nutritional status of members of a village community has been carried out (Orraca-Tetteh and Watson 1975). The perceived needs of the community were ascertained by discussion. These included the need for clean water supply, good roads, health facilities, and inputs for farming activities. Some of these were provided through communal efforts and the assistance of other agencies, such as community development officers, health teams and agricultural officers. The nutrition educators involved recognised the need for multidisciplinary activities in trying to improve the nutrition of people. Nutritionists and nutrition educators must be provided with the necessary skills during training to enable them to become effective in dealing with community problems which affect nutrition. Such activities also provide relevant opportunities for research work in the area of nutrition education.

Continuing Education of nutritionists

Nutrition is still a young subject. Research in nutrition is bringing new facts to light and modifying our understanding of the subject. It is of vital importance that research nutritionists, applied nutritionists and nutrition educators should all keep abreast with this new knowledge. This is particularly so at university level, where young nutrition graduates are being trained.

Continuing education could be provided in various ways, such as refresher courses, workshops, seminars, symposia and conferences. In developed countries, such as the United States of America and Britain, there are many such facilities available to nutritionists, but these are woefully lacking in most developing countries. In the United States, many nutrition departments organise various food and nutrition courses during the summer periods for interested participants. In addition, various professional associations and societies of nutrition, such as the Nutrition Society of Great Britain, the American Institute of Nutrition and the Society for Nutrition Education, organise periodic meetings at which current information and research results in food and nutrition are provided for its members. Publications and journals from such organisations enable nutritionists in both the developed and developing countries to keep abreast of their subject. Unfortunately current inflationary trends are affecting the acquisition of library materials in most developing countries, particularly in Africa. This is adversely affecting both research and teaching.

The importance of continuing education for the nutrition educator is even more pressing now, because of the great increase in nutrition misinformation and conflicting misinterpretation of information relating to diet and disease in man. The profusion of information, particularly from the mass media concerning food makes it imperative that efforts should be made to design and provide continuing education for the nutrition educator. Relevant information and courses in the social and behavioural sciences should form an integral part of such continuing education.

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4.2 Nutrition Education for Food Scientists

by

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The science of food is concerned with the physical, chemical, and microbiological properties and the sensory characteristics of food from its source to its consumption, and with the relation of these properties to human nutrient requirements. During its manufacture and distribution, food may be subjected to a range of processing and storage conditions which cause changes in these properties.

In the western world, we have come to rely increasingly on the Food Industry to provide a wide range of foodstuffs all the year round. At the present time, over 70 per cent of expenditure on food eaten within the home in the United Kingdom, is purchased in a processed form (MAFF, 1982). The centralisation of food preparation in this way places great responsibility on the Food Industry to provide safe, wholesome food. Those within the industry rely in turn on the skill and knowledge of the food scientist or food technologist to oversee food production, storage and distribution, to engage in research and development to produce new products, to incorporate more cost-effective ingredients into existing products and to interpret the ever-increasing amount of legislation that applies to the Food Industry.

Nutrition and the Food Industry

The Food Industry in the United Kingdom has the responsibility of providing food that is, to quote the relevant legislation 'of the nature, substance and quality demanded' (Food and Drugs Act, 1955; see Fortescue, 1981). As it is the consumer and not the food manufacturer who, in the long run, decides on the food he or she will eat, it is not the role of the Food Industry to seek to improve the health of the general public. Traditionally, as far as nutrition is concerned, the main concern of the Food Industry has been to avoid the detrimental changes to specific nutrients, especially vitamins, which can occur during processing of individual food items. Indeed, nutrient losses within the context of complete diets are rarely considered, nor are the advantages of food processing (such as the increased digestibility of starches and proteins due to cooking). Since most nutrients are relatively stable under the rapid conditions of processing used in modern food manufacture (which is aimed at rapid treatment to achieve microbiologically-safe food with the best possible sensory characteristics), significant losses of nutritional value of food during processing only occur with susceptible nutrients, such as vitamin C.

Most people, in the industrialised countries, obtain adequate supplies of nutrients from a good mixed diet, which includes processed foods. This is so, despite the fact that some special groups in the population, such as children and pregnant women, may have higher requirements for certain nutrients than the general population. Indeed, we have never had such a wide variety of wholesome food to choose from (Hegsted, 1980), but the same is not true in the developing world. In these countries, poverty and inadequate systems of food distribution may lead to food shortages and malnutrition. Nevertheless, even in the western world, there is no room for complacency, because survey results have shown that the institutionalised are particularly vulnerable to specific nutrient deficiency, such as that caused by loss of vitamin C in large-scale catering (Turner and Glew, 1982).

As well as losing vitamins during processing, losses of dietary fibre through refining processes, such as milling of wheat to produce white flour, are considerable. In recent years the lack of dietary fibre in the refined western diet has been the subject of a great deal of research interest (see for example reviews of recent research in Birch and Parker 1983). The implications of the lack of this non-nutrient in the diet may be more important than the loss of nutrients during processing. If the dietary-fibre hypothesis is confirmed by experimentation, as recent data seem to indicate that it will be, then considerable research effort will be needed within the Food Industry to develop high-fibre products that are acceptable to the consumer.

In the United Kingdom over-nutrition tends to have a greater influence on health than under-nutrition. Energy intake in excess of requirements causes obesity, which is itself associated with an increased incidence of a number of diseases, such as diabetes. For this reason, obesity is associated with a lower life expectency. Over-consumption of certain major food components, in particular fat, has also been associated with increased incidence of diseases such as coronary heart disease. Collectively these diseases are known as the 'diseases of affluence'. Over the last decade, several governments in the western world have published dietary goals or guidelines with a view to encouraging healthy eating patterns to reduce the incidence of these diseases. One such set of dietary goals was the McGovern report from the USA (US Senate Select Committee, 1977), which led to considerable controversy and opposition, especially from the farming community (Austin and Quelch, 1979), who were alarmed at the recommendations for decreasing the consumption of animal products. Dietary changes such as these would also have far-reaching effects on the Food Industry. The subject of introducing such changes in the diet has been approached cautiously in the United Kingdom, with due regard to the limits of present knowledge (DHSS, 1978). Passmore et al. (1979) have assessed the main effects that a change to more moderate eating habits would have on the British diet. These would be a moderately reduced intake of fat, sugar, meat and alcohol, with increased intakes of cereals, potatoes, other vegetables and fruit, and no change in the intake of milk, eggs, fish, pulses and nuts.

Possible approaches for implementing the UK dietary guidelines (DHSS, 1978) and the consequent repercussions for all industries involved in the food chain have been discussed recently at the British Nutrition Foundation (Turner and Gray, 1982). Many nutritionists are of the opinion that the best way to promote good eating habits is through education of the consumer. Although blanket approaches, such as legislation, subsidy and

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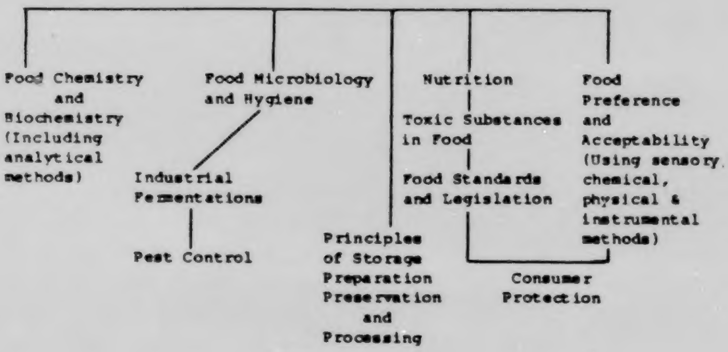
taxation, may (potentially) be able to achieve results more rapidly, they encroach on individual freedom of choice. However, irrespective of the cause of the demand, any change in the composition of manufactured foods that may be required in the future, will lead to considerable research and development, needing the skill and knowledge of food scientists and technologists (Johnson, 1980).

Training in Food Science with Emphasis on Nutrition Education

The subject of food science is a multidisciplinary one, and comprises food chemistry, food microbiology, food processing and the sensory evaluation of food, as well as nutrition (see Figure 1). For the study of such an applied science, it is necessary to draw on knowledge obtained by a study of appropriate pure sciences as well as other related applied sciences. In particular a knowledge of chemistry, biochemistry, physiology and microbiology is needed and, to some extent, psychology, physics, botany and zoology.

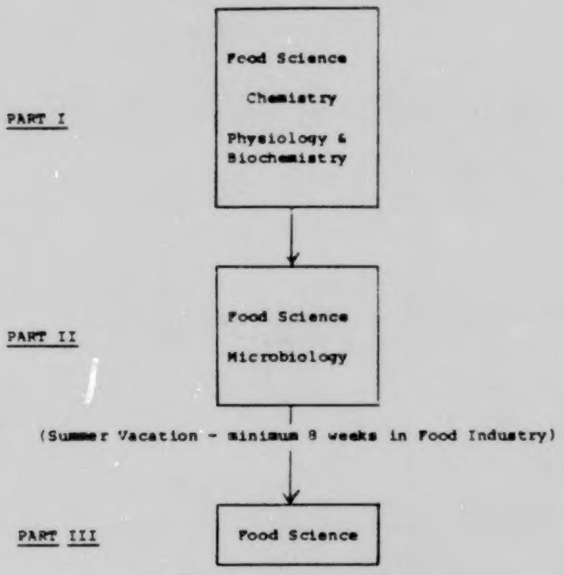
Figure 1 Scope of Food Science


Food Chemistry and Biochemistry (Including analytical methods)
Food Microbiology and Hygiene
Industrial Fermentations
Pest Control
Principles of Storage Preparation Preservation and Processing
Nutrition
Toxic Substances in Food
Food Standards and Legislation
Consumer Protection
Food Preference and Acceptability (Using sensory, chemical, physical & instrumental methods)

Degree courses in food science and food technology are offered at eight universities in the United Kingdom. These are Belfast, Leeds, London (Queen Elizabeth College), Loughborough, Nottingham, Reading, Strathclyde and Surrey. As I am a lecturer in the Department of Food Science of the University of Reading with particular responsibility for teaching nutritional and toxicological aspects of food science, I will use my Department as an example to discuss the role of nutrition education in the training of food scientists. We offer three honours BSc courses in food science, two taught MSc courses and higher degrees by research.

To examine details of the structures of the food science courses, I will take as an example our BSc food science course, which is divided into three parts (Figure 2), roughly corresponding to the first, second and third years of the course.

Figure 2 BSc Food Science Course structure



The basic sciences, taught by other departments are chemistry and physiology with biochemistry (both in Part I) and microbiology (in Part II). Food science is taught throughout the three years and, since this is a vocational training course, with many graduates being directly appointed to positions in the Food Industry, it is necessary that they receive adequate grounding in all aspects of the subject. Therefore, there is a considerable amount of material to be covered in three years. For this reason, only a limited amount of time can be allocated to the subject of nutrition, which, as a consequence, needs to be taught in a relatively condensed manner.

Two factors are helpful in teaching nutrition on the food science courses. Firstly, in a food science course, much of the subject matter taught under the heading of 'Nutrition' in a course dedicated purely to that subject, is taught in other areas, in particular under the heading of 'Food Chemistry'. Although we do not run practical classes specifically in nutrition, many nutritional and toxicological principles are illustrated in practical classes in 'Food Chemistry'. The second factor is that nutrition is taught at a relatively late stage in the course, and therefore full use can be made of the students' prior knowledge, such as the structures of proteins, carbohydrates and lipids. This allows discussion of nutritional topics in considerable depth in a very short space of time. Considerable use is made of visual aids with complementary handouts being given to the students at the beginning of each lecture.

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Within the BSc food science course, nutrition is taught in two parts, as shown in Tables 1 and 2. Nutrition Course 1 (Table 1) is concerned with basic nutrition and covers energy and protein requirements.

Table 1 Nutrition Course 1 (20 hours)

Nutritional requirements, energy, protein, dietary fibre,
Vitamins, using examples of vitamins C and A
Minerals, using examples of calcium, iron and zinc

Table 2 Nutrition Course 2 (20 hours)

1. Nutritional changes in food during processing and storage
2. Nutrition and the Food Industry
3. Assessment of the nutritional status of the population
4. Methods of research in human nutrition
5. Nutrition of specific human groups
6. Infant feeding
7. Diabetes and diabetic diets
8. Obesity and its implications for health
9. Diet, blood lipids and coronary heart disease
10. Healthy eating

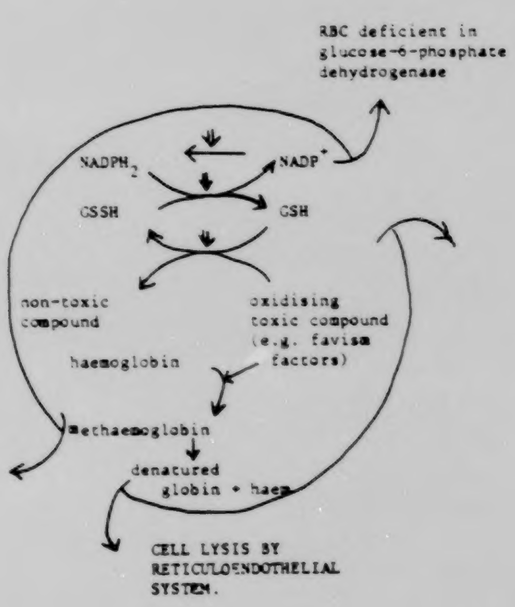
Students learn about the structures and properties of vitamins and minerals in other courses but, even so, the nutritional aspects of all nutrients cannot be covered in a short course, and so examples only are given. In selecting these examples, it was important to consider the relevance of a particular nutrient in terms of the total diet and in terms of someone working in the Food Industry. Therefore, the reasons for selecting vitamin C as an example of a water-soluble vitamin were that diets in many parts of the world are deficient in this vitamin and also, in the United Kingdom, special groups, such as the elderly, may be at risk. In addition, vitamin C is often lost during processing, and for this reason its presence in fruit and vegetables has been used as an indicator of the degree of severity of processing.

The rationale for the selection of calcium, as an example to illustrate mineral nutrition, was that, as well as being a mineral of particular concern in the nutrition of special groups, there is a well-established understanding of its physiological action. Also, factors affecting its absorption are of particular interest from an exemplary point of view. Iron is a nutrient which is generally lacking in the diet of many nations, both rich and poor, and thus it is often used by food manufacturers to fortify foods. Zinc nutrition was chosen as an up-to-date topic which has recently received considerable research attention. Unlike calcium, zinc nutrition is not adequately covered in standard texts on nutrition, and yet it is a topic on which a professional food scientist may be called upon to express an opinion.

The aims of Nutrition Course 2 (Table 2) are to provide the students with an overview of the main applied nutrition areas with which they will need to be conversant in their future employment, and particular attention is paid to currently active areas of research. As no one person is likely to be sufficiently knowledgeable to cover all the topics shown in Table 2 a number of nutritional scientists involved in various aspects of the subject contribute to this course.

As well as being involved with Nutrition Courses 1 and 2, I also give a course entitled 'Toxic substances in food'. Various aspects of toxicology are taught elsewhere in the food science course under headings such as 'Food Chemistry', 'Food Microbiology' and 'Legislation'. The aims of the course on 'Toxic substances in food' are to provide information for the student on current methodologies for toxicological testing, and to explore the hazards to health of naturally occurring toxic substances, those arising in foods adventitiously (e.g. heavy metals), as well as the risk versus benefit balance of the use of additives. Figure 3 shows a typical example of the visual-aid material used for this course.

Figure 3 An Example of Visual-Aid Material Used in the Course "Toxic Substances in Foods": Biochemical Basis of Favism caused by Faba Beans


RBC deficient in glucose-6-phosphate dehydrogenase
⇓
NADPH$_2$
NADP$^+$
↓
GSSH
GSH
⇓
non-toxic compound
oxidising toxic compound (e.g. favism factors)
haemoglobin
methaemoglobin
↓
denatured globin + haem
CELL LYSIS BY RETICULOENDOTHELIAL SYSTEM.

↑, increase; ↓, decrease; ⇓, reaction inhibited; GSH, reduced glutathione; GSSH, oxidised glutathione; NADP, oxidised nicotinamide adenine dinucleotide phosphate; NADPH$_2$, oxidised NADP; RBC, red blood corpuscle.

Students registering for our honours BSc courses are mainly home students. However, those on the MSc courses originate mainly from overseas, particularly the developing world. In the past decade students from 46 countries have taken the MSc course.

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In many of these countries malnutrition may be widespread, and problems due to overeating unknown, except in elite circles of society. Nevertheless, in all developing countries, the population is expanding and urbanisation is increasing. This brings increased requirements for the centralisation of food preparation and thus for the need for a food industry to provide efficient preservation, storage and distribution of food. This, in turn, brings demands for better-trained personnel. Overseas students registered for our MSc courses learn how best to process and store food that is safe to eat and that has the best possible nutritional properties and sensory characterisitcs. They also become aware of some of the problems due to our eating habits that we have encountered in the western world. As the economies of the developing countries improve and their people become more affluent, these MSc graduates will be in a position to advise those concerned on ways of achieving a healthy diet.

After graduation, most of our students are employed in the Food Industry in production management or research and development (together these take some 45 per cent of the BSc graduates). Overseas students return to their own countries and either continue in employment from which they were seconded for the period of study, or may be appointed to key posts in government or universities.

Conclusion

Despite the recession, there is a continuing demand by the Food Industry for trained food scientists and food technologists. Universities have an important role to play in providing graduates for the Food Industry with an all-round appreciation of the subject area. Although the time which can be allocated to the study of nutrition within a food science degree course may be relatively limited in the United Kingdom, it is our experience in the Department of Food Science that it is better introduced towards the end of the course, when students have already acquired a good understanding of the basic sciences, and of food components and their interactions during processing and storage. Traditionally, nutrition has been given relatively low priority by the Food Industry, but consumer reaction to publicity given to dietary goals and guidelines in the western world may change this. If so, we anticipate that our graduates will be able to instigate and implement appropriate modifications to manufacturing practices.

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4.3 A survey of College-Level Nutrition Education programmes in Jamaica

by

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A 1980 survey entitled the Position of Nutrition Education within Colleges of Education in the West Indies conducted by the present author, several concerns which appeared to affect teacher training programmes in this field. The main problem areas which came to light were the following:

- lack of status and recognition of Nutrition as a 'respectable' science;
- insufficient financial support from the respective governments of the

region, for mounting 'good' Nutrition Education programmes in the colleges;
- a paucity of qualified teacher trainers; and
- a number of shortcomings relative to the trainee teachers themselves, such as weak entry qualifications (for admission to college), poor levels of academic performance at college, and less than desirable attitudes toward the nutrition education courses offered.

This paper explores this last point in depth. Bearing in mind that the survey findings reflected the views of college staff alone, additional data had to be collected from the students themselves, as well as from the college records, before an accurate picture of the situation could be constructed. Findings reported herein span the period, from 1979 to 1983, and probe specifically:

- enrolment and graduation figures of nutrition education trainee teachers;
- entry qualifications of these students;
- performance levels in the final intramural examination in Nutrition Education and in the entire examination; and
- attitudinal predispositions in respect of Nutrition Education, such as:
  a. Student teachers' views on the importance of Nutrition Education and the need for teachers of this subject in the schools;
  b. Their reasons for electing to specialize in this field;
  c. The perceived status and prestige of Nutrition Education as a specialist area of study at college;
  d. Views on the quality of the Nutrition Education courses taught at college; and
  e. Opinions of the consequences of stereotyping Nutrition Education as a 'feminine' field of endeavour.

  (areas a - e were only studied in 1982 to 1983.)

The teachers' colleges have traditionally been the institutions responsible for training the majority of Nutrition Education and Home Economics teachers in Jamaica, although one or two other institutions have also made a contribution. There are at present ten teachers' colleges on the island, one of which has only recently been opened. Of the nine established institutions, three currently train primary-level teachers and thus make no contribution to the cadre of Nutrition Education specialists in secondary schools, and one which trains secondary teachers, does not offer Nutrition Education as an area of specialization. Intramural training for both primary and secondary teachers takes two years, after which successful students embark upon a year's internship programme. At the end of this period, and on the basis of their teaching practice performance, they may be certified as trained teachers.

Enrolment Data

Table 1 gives enrolment figures for second year (secondary) specialists only, for it is in this group of students that Home Economics and Nutrition Education teachers are to be found. Certain colleges do, however, offer short courses in Nutrition Education for primary trainees, but this is only during the first year of the college programme, and in two of these institutions, is available to female students alone.

Table 1 Numbers of Nutrition Education and Home Economics Specialists in Teachers' Colleges during the period 1980-1982

College	1980				1981				1982			
	Total No.Ss	No.of Males	HomeEc/N.Ed Specialists		Total No.Ss	No.of Males	HomeEc/N.Ed Specialists		Total No.Ss	No.of Males	HomeEc/N.Ed Specialists	
			f	%			f	%			f	%
1	164	66	14	8.5	133	53	9	6.8	98	45	10	10.2
2	128	0	15	11.7	83	0	3	3.6	62	0	12	19.4
3*	-	-	-	-	52	14	8	15.4	70	15	12	17.4
4	49	0	12	24.5	29	0	9	31.0	38	8	8	21.1
5*	-	-	-	-	29	5	12	29.4	26	6	10	38.5
6*	-	-	-	-	17	5	5	41.4	-	-	-	-
Total	341	66	41	12.0%	343	77	46	13.4%	294	74	52	17.7%

*In these colleges, no secondary training programme was being offered in the years indicated

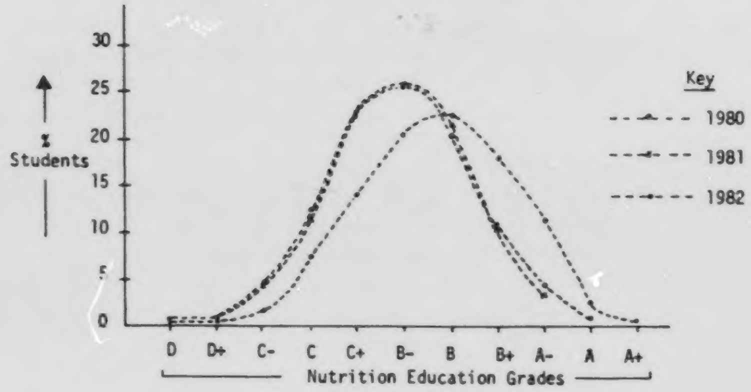
(Figures obtained from the Joint Board of Teacher Education)

Table 1 points to the small percentage of students who specialized in Nutrition Education and Home Economics during the period from 1979 to 1982 and the proportional variation in numbers across colleges each year. It should be pointed out that all Nutrition Education students during this period were female!

Performance Levels

The final examination consists of two theory papers set on 'Food Preparation, Service and Nutrition', along with a special project and 'Food Preparation and Service' practical. There is, in addition, a course-work component which can contribute up to 40 percent of the overall result, the examination being weighted 60 percent. The lowest passing grade on a 13-point scale is C-. For the three years under review, the average Nutrition Education grade, overall, ranged from B-/B to B/B+, while individual students' performance spanned virtually the entire scale, as shown in Figure 1. The average performance on the entire college programme (inclusive of the Nutrition Education component) was C/C+ for 1980 and 1981, and B- for 1982.

Figure 1 Performance of Final Year Nutrition Education Specialists: 1980 to 1982



An analysis of Nutrition Education performance levels on an individual college basis showed that overall College 1, a co-educational institution, displayed markedly lower scores than the others. It was decided to examine the data according to college type (co-educational or single-sex) and to plot the percentage of students who were performing at each grade level for the period under review. From this it was found that at least for two years (1981 and 1982), the levels were basically higher in the single-sex than in co-educational colleges. The actual mean scores by college type are shown in Table 2. Students from single-sex colleges did, in fact, perform significantly better in 1981 than their counterparts in the co-educational institutions.

Table 2 Mean Performance Levels in Nutrition Education - By College Type

College Type		1980	1981	1982
Co-educational	N	14	34	40
	Mean	6.000	5.647	6.033
	S.D.	1.881	1.252	1.377
Single-Sex	N	27	12	12
	Mean	6.042	6.778	6.652
	S.D.	0.920	0.651	1.923

Entry Qualifications

The official minimum entry requirements for students who wish to enter secondary-level training at teachers' college are four G.C.E. Ordinary Level subject passes (including English Language in the Cambridge School Certificate). Those wishing to train as primary school teachers must have passed the Third Jamaica Local examination, or have at least five subjects in the Jamaica School Certificate Examination (including English Language and Mathematics). Since the 1970's, however, students holding J.S.C. passes (or a combination of J.S.C./G.C.E. 'O' levels) have been permitted to train as secondary teachers, despite the fact that the J.S.C. is of a lower academic level (equivalent to about grade 9) than the G.C.E. Research findings have indicated that students who entered teachers' colleges with G.C.E. qualifications perform better as a group in the final examination than those with J.S.C. passes. Thompson and Hibbert (1978) for example, found that about 13 per cent of final year students with Ordinary Levels gained college grades of B+ and above, compared with 2.6 per cent students holding only J.S.C. passes.

The entry qualifications for 93 of the 139 Nutrition specialists at college between 1979 and 1982 were compared with the final grades in a similar manner to Thompson and Hibbert (1978). Results followed the same pattern - students entering college with G.C.E. qualifications performed better as a group than those entering on the basis of J.S.C. subject passes. It was also ascertained that O-level performance in subjects which are considered to be useful pre-requisites to the study of Nutrition Education (for example, Food and Nutrition, Cookery and the Sciences) does, in fact, predict performance in the subject at college quite well. In view of the differences betrween college types already discerned, it was decided to re-examine entry qualifications. Findings revealed that specialists in single-sex colleges held higher entry qualifications, there being 60 percent with four or more O-level passes compared with 25 percent in the co-educational institutions.

Attitudinal Considerations

It is a well established fact that research endeavours dealing with students' performance in an academic setting ought not to concentrate on the cognitive domain at the expense of additudinal or motivational behaviours. In the light of this, it was necessary to tap college students' attitudes to Nutrition Education and related aspects, in order to obtain a more complete picture of the situation. Because of the co-education single-sex variations in performance identified, it was decided to sample on the basis of college type.

At present, there is only one single-sex college in operation (College 2), so this institution virtually selected itself. College 1 was chosen to represent the co-educational institutions. At both sites, sampling embraced both specialist Nutrition Education trainees, as well as those concentrating on some other area, the target groups all being final year secondary level trainees. A number of areas were investigated, ranging from opinions on the importance of Nutrition Education, reasons for specializing in this field, and views on the Nutrition Education course itself (for specialists), to attitudes associated with sex-role stereotyping of the subject (for both specialists and non-specialists).

Table 3 Specialists/Non-specialists scores on items probing sex-stereotyping of pupils

Items	College 1						College 2					
	Sp Ss			Non-Sp			Sp Ss			Non-Sp		
	A	U	D	A	U	D	A	U	D	A	U	D
	(N=6)			(N=14)			(N=13)			(N=15)		
Section B:												
10. It's all right for a boy to do some of the cooking for the family	6	0	0	12	2	0	13	0	0	15	0	0
11. If there are both boys and girls in a family, only the girls should do jobs like cleaning, cooking and dish-washing	0	0	6	0	0	14	0	0	13	0	0	15
12. There are certain subjects taught in school, e.g. Physics and Chemistry, which should be taught to boys only	0	0	6	0	5	9	0	0	13	0	0	15
13. All students in school - both boys and girls - should study some Nutrition Education.	6	0	0	9	3	2	13	0	0	15	0	0
14. In school, boys should be allowed to study Home Economics if they want to	5	0	1	14	0	0	13	0	0	15	0	0

Specialists' views on the Nutrition Education course were strongly positive at both colleges. Students saw the course as being very interesting and informative, somewhat challenging and stimulating, certainly not dull nor irrelevant, and not particularly difficult. Responses to items tapping reasons for specializing in Nutrition Education indicated that this was a personal choice, not influenced by others, but arising out of a specific interest in the subject. Students also perceived the need for more Nutrition Education teachers in the schools, and saw themselves being prepared to fill this need. In respect of the comparative data obtained for specialists/non-specialists at these two colleges, items addressing sex-stereotyping of boys and girls similarly suggested positive views, as shown in Table 3. Comparative data on the set of items dealing with opinions of Nutrition Education as a 'feminine' subject, and the prestige value of this area at college, gave more diversified responses as shown in Table 4.

Table 4 Specialists/Non-specialists scores on items probing sex-stereotyping of Nutrition Education at College

Items	College 1						College 2					
	Sp Ss			Non-Sp			Sp Ss			Non-Sp		
	A	U	D	A	U	D	A	U	D	A	U	D
	(N=6)			(N=14)			(N=13)			(N=15)		
Section B:												
1. By nature, women are better suited to be Nutrition Education teachers	3	1	2	9	3	2	7	1	5	8	3	4
2. Nutrition Education is one of the easier courses at college	0	2	4	9	0	5	0	0	13	0	6	9
3. More men should be encouraged to specialize in Nutrition Education	6	0	0	8	6	0	13	0	0	10	5	0
4. Men would make just as good teachers of Nutrition Education as women	5	1	0	5	6	3	10	3	0	9	4	2
5. The fact that there are no male tutors of Nutrition Education probably discourages men from studying this field	3	3	0	9	3	2	8	3	2	11	3	1
6. Since women are the homemakers, they are by nature, better suited to be Nutrition Education teachers	2	2	2	8	2	4	5	6	2	3	7	5
7. If a man were to study Nutrition Education, he would be considered a sissy	3	2	1	6	4	4	2	2	9	0	2	13
8. Nutrition Education is regarded as a "low prestige" subject at college	4	0	2	10	3	1	4	2	7	1	6	8
9. Students generally opt for Nutrition Education because it is one of the easier subjects	0	0	6	7	4	3	0	0	13	4	2	9

These results suggest a number of trends:

a. The feeling is that women are better suited for Nutrition Education than men, although at College 2 the view was expressed that men could make just as good teachers of this subject. Some uncertainty on this point is evident among the non-specialists at College 1.

b. Respondents have indicated that more men ought to be encouraged to specialize in Nutrition Education; the fact that there are no male tutors in the field is seen as a limitation to this.

c. Respondents at College 2 and specialists at College 1 do not feel that Nutrition Education is one of the easier courses. However, non-specialists from College 1 hold this opinion, and feel that this is one of the reasons why students opt for the subject.

d. Nutrition Education tends to be regarded as a 'low prestige' subject at College 1 - by both specialists and non-specialists. This is not the case at College 2.

Subtle differences of opinion between the colleges are evident from these findings. One can deduce that in the co-educational college, Nutrition Education is a field to be avoided by men, for fear of being branded a 'sissy'. It is not upheld as a prestigious subject - rather, it is one to be pursued by those (women) who, whether through laziness or lack of the intelligence to do better, must select an easy option. The pattern of responses suggests that these views are not held by non-specialists at College 1 alone. Indeed, it is apparent that some of these feelings have been transmitted to the future teachers of Nutrition Education being trained at this college, and unfortunately, may be even more deeply internalized than has been made evident from this limited study.

Discussion of the Findings

According to the Five-Year Education Plan (1978-83) for Jamaica, the most recently published document of its kind,

> "The common core of learnings at the first level (grades 7, 8 and 9) of all secondary stage institutions will consist of Agriculture, Art and Crafts, English, Industrial Arts OR Home Economics, Mathematics, Physical Education, and a second language, Science and Social Studies." (p. 71) (Author's emphasis)

Implicit in the Industrial Arts/Home Economics choice is the intention that boys should generally tend to opt for Industrial Arts, and girls for Home Economics. Evidence supporting this deduction can be obtained from a number of sources, especially certain student data for the period immediately preceding the publication of the Five-Year Plan (1976-1977), as is shown in Table 5.

Table 5 Student Enrolment, 1976-77, in Industrial Arts and Nutrition Education subjects: by sex and school type

School Type	Subject	Sex	No. of Students	M/F Ratio
New Secondary (grades 7-11)	Home Economics	M	736	
		F	19,544	1:27
	Cookery	M	124	
		F	4,409	1:36
	Woodwork	M	17,238	
		F	1,404	12:1
	Metalwork	M	9,504	
		F	392	24:1
Secondary High (grades 7-13)	Home Economics	M	144	
		F	1,597	1:11
	Cookery	M	9	
		F	3,582	1:398
	Woodwork	M	1,549	
		F	0	1549:0
	Metalwork	M	1,218	
		F	0	1218:0
Technical High (grades 7-11)	Home Economics	M	144	
		F	2,222	1:15
	Cookery	M	1	
		F	502	1:502
	Woodwork	M	755	
		F	12	63:1
	Metalwork	M	951	
		F	7	136:1

Source: Annual Statistical Review of the Education Sector, Ministry of Education, Jamaica, 1976-77, pp.154-161

It can be seen from Table 5, that even if Nutrition Education subjects were intended for girls, a large number of those enrolled in

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secondary institutions were not receiving instruction in this area. For the period, 1976-77, enrolment figures showed some 100,000 girls were on the register in grades 7 to 13, yet only approximately 32,000 could be accounted for in Nutrition Education classes! The answer given to the question of "Why?" has consistently been, "Inadequate teacher supply in this field!"

This study has pointed to the low numbers of teachers' college students being trained each year in Nutrition Education. Although in the past three years there have been instances of as many as 41 per cent of the final year secondary student body specializing in Nutrition Education or Home Economics, overall less than 20 per cent of the total have, in fact, opted to do this subject. It has also been observed that numbers vary across colleges. Taken on the whole, performance levels have been reasonably good, but on an individual college basis a different picture emerges. Results suggest that students in single-sex colleges have demonstrated a somewhat better level of attainment than those in co-educational institutions (significantly so in 1981); this view is compounded by the finding that more grades were awarded at credit/honours standard in single-sex colleges, while at the co-educational ones more students failed. It is perhaps not unexpected to find that the entry qualifications of students entering single-sex colleges appear to be of a higher standard than seems to be the case for their co-educational counterparts. There have also been indications of subtle differences in attitudes toward Nutrition Education between students at the two college types.

The view has been expressed in a number of quarters that the concern of educators too often lies only with course content and the promotion of knowledge, and fails to take into account other pertinent factors operating within an educational context (for example, the student variables discussed in this paper). This seems to be the case with the training of Nutrition Education specialists in a number of Jamaican teachers' colleges, especially the co-educational ones. Aylward (1980) has quite rightly pointed out that:

> "Proposals to introduce Food and Nutrition teaching in schools are likely to be ineffective in any one country unless there is sustained support from appropriate colleges of education." (p. 76)

In this respect, Jamaica suffers the problem of relatively few Nutrition Education teachers graduating from college each year - a problem compounded by the high teacher turn-over rate in the schools. There is therefore the pressing need to ensure that all who are accepted into college to train in this field benefit fully from the exposure received. Not only must they be well grounded in content and teaching methodology; they should also develop an appreciation for Nutrition Education as a highly respected science, and come to value their future role and the contribution to be made as teachers of this subject.

Notes

1. For details of this survey see Chapter 1 of Unesco's Nutrition Education Series No. 2, The Role of Colleges of Education, entitled,

"Nutrition Education: The Role of the Colleges of Education", by Marlene Hamilton. Paris: Unesco ED 82/WS/119, 1983, pp. 3-44.

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4.4 Learning by Doing - student participation in nutrition education surveys

by

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Queen Margaret College is a Scottish central institution, similar in many respects to an English polytechnic. The work reported here forms part of a teaching module on food habits for final year BA students following a food studies option in Home Economics. After graduation the majority of these students go on to further training for teaching.

The aim of the exercises outlined here is to give students practical experience of the many difficulties surrounding the assessment of eating habits. Students discuss and help design a questionnaire which they then administer to the general public. Collating and processing of the data is carried out by staff. Results of each survey are discussed with student groups. We have found this to be a successful method of capturing the interest of students. A lively discussion of key areas in nutrition education usually results.

The content of the questionnaires has to cover an area of topical interest and preferably of local relevance. Considerable regional variations in eating patterns exist in Scotland compared with the rest of the United Kingdom. However, these traditional differences are likely to become less marked as social change progresses. The first survey examined evening meal patterns, traditionally different in Scotland. The next two surveys focussed on dietary practice and nutritional knowledge in a key area; that of consumption of sugar and sweet foods. The fourth survey on health foods was carried out in collaboration with another colleague as part of a follow-up study.

The method used in these surveys was that of administration of a short questionnaire, by interview, to members of the public. Since the surveys form part of students' classwork, the interviews were restricted to a two hour period on one afternoon only. In order to cover a large sample of the public in different areas of the city, interviews were conducted outside large supermarkets and shopping centres and in the university area. Prior permission was given for this. Students worked in groups of three or four; each student interviewed up to twenty-five people. A standardised preamble and question sequence was rehearsed and followed by all students. The importance of accurate recording of all responses was emphasised including recording of refusals to co-operate.

The first survey investigated the evening meal. Traditionally Scots are said to eat their main meal in the middle of the day, the evening meal being carbohydrate-based and known as 'High Tea'.

The National Food Survey shows slight regional differences in average consumption of carbohydrates, fat and protein, as indicated in Table 1.

Table 1 Food Consumption Trends

Percentage energy from:	Scotland	UK
Carbohydrate	45.8	44.6
Fat	41.2	42.4
Protein	13.1	13.0

Source: Household Food Consumption and Expenditure: HMSO 1979

The questionnaire was administered in November 1979 to 359 subjects. The number of respondents and distribution by age is shown in Table 2.

Table 2 Dinner/High Tea Survey Participants by age group

Age	Percentage
17	9
18 - 27	53
28 - 45	25
45	13

N = 359

They were first asked: "Is your evening meal normally your main meal of the day from Monday to Friday?" The evening meal was considered the main meal of the day by eighty-four per cent of the sample. The type of meal eaten, high tea or dinner, was investigated by asking respondents: "Which of the following foods are you likely to include in your evening meal?" A prompt card with a list of 17 foods was shown. The meal type was classified using certain key foods: for example foods 1 and 9 (soup, fruit juice or other 'starter' and green leafy vegetable) are likely to be included in a dinner menu, whereas foods 12 and 13 are typical of a Scottish high tea (scones, pastries, sweet biscuits and jam, honey, marmalade). Results are given in Table 3.

Table 3 Meal Type Dinner/High Tea

Dinner	66.2%
High Tea	18.7%
Not clear	16.7%

N = 359

This shows that, in our sample, two thirds of the people questioned eat an evening meal which can best be described as dinner. Traditional high tea was eaten by far fewer, about one-fifth of the sample. In a number of replies (16%) it was not possible to make a rigid classification. Reasons for a meal being 'not clear' included: people who ate very few items, for example, one course only, or who ate a variety which crossed the two groupings. It was interesting to note (Table 4) that the high tea meal is not confined to Scots, although more people eating this kind of meal were of Scottish origin. (Seventy per cent of the people interviewed were Scots).

Table 4 Meal Patterns

	Dinner	High Tea
Scots	168	51
Non-Scots	67	15
Total	235	66

$x^2 = 0.61$ NS

This difference was not statistically significant.

In view of the prevalence of obesity in the United Kingdom, the next question was of some interest. It was: "Have you ever had a weight problem?"

Table 5 Those admitting a weight problem

	Males	Females	Total
Weight problems	22	91	113
No weight problems	86	160	246
Total	108	251	359

$x^2 = 8.0$ ($P < 0.01$)

N = 359

Approximately one third of our sample answered 'yes'; the majority of these replies were from women. This probably reflects a sex difference in the incidence of obesity: it may also indicate a greater awareness among women of a desirable body image. This difference was of statistical significance ($P < 0.01$).

Those who admitted to a weight problem were then asked a supplementary question: "If the answer is yes, has this altered the type of evening meal you eat?" Slightly over half of those with a weight problem had altered their evening meals, again predominantly women. There was no statistically significant difference between men and women.

An attempt was also made to define the social class of respondents. This enquiry was not well received. This is, of course, a difficult area, particularly when interviews are conducted by students and questions have already covered another sensitive area - that of eating habits.

To summarise:

It would appear that, in this sample at least, meal patterns, particularly the type of evening meal, correspond more closely to the pattern of the United Kingdom than they do to the traditional Scottish pattern.

Our second survey, in November 1980, was more ambitious: this time we attempted to monitor eating practices and knowledge of nutrition in one specific area, that of consumption of sugar and sweet foods. This approach proved to be such a valuable learning experience for students that it was repeated in 1981 and therefore the surveys are considered together. The only difference between these two questionnaires was in subsidiary questions on folic acid; the main questions on sweet foods were identical.

These two surveys once again examined a regional issue. Traditionally the Scots eat more confectionary and sweet foods than other regions of the United Kingdom. Sugar refining and the manufacture of confectionary have been important industries in Scotland since the middle of the nineteenth century. The surveys attempted to measure the preference for sweet tasting foods (a sweet tooth) and general knowledge of the effects of sugar on health. Much of this knowledge probably comes from informal sources such as the mass media.

In order to assess the degree of preference for sweet foods, two surveys were carried out. Analysis indicated that the younger participants and men over 45 show a greater preference for sweet foods than women or men aged 18-45.

There was no statistically significant difference in knowledge between men and women in any age group. Only when females aged 28-45 were compared with those over 45 was there a statistically significant difference (P 0.01). The older women scored less. The 'target' groups for nutrition education programmes seem to be those under 18 and over 45.

To conclude: "Learning by Doing" is proving a valuable and interesting experience for students. Despite the constraints of the present surveys, they can provide pointers and identify trends of relevance to Nutrition Education.

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4.5 The Place of Nutrition in Teachers' Curriculum as a Tool for Rural Development

by

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In several African countries, especially those in East Africa and Uganda, malnutrition - the so-called African disease - is due not so much to lack of food as to lack of knowledge about food. Malnutrition is found more in rural people than urban dwellers. This is not because rural people do not have enough food, since most food in a country like Uganda is produced in the rural areas. The main reason is that rural people lack knowledge about food. Contributory reasons include poor nutrition teaching in the schools, lack of integration between schools and the community, lack of knowledge on how to use the local environment in nutrition, and sometimes a lack of peace.

Many people in rural areas eat bulky carbohydrate meals to satisfy their hunger rather than to get a balanced diet which provides the necessary nutrients for health. They prefer bottle-feeding to breast-feeding because they want to appear modern, Westernised or educated. They despise eating locally-available foods because they think that such foods are for the uneducated and the poor. For example, most people in rural areas regard eating ground nuts, dried beans, peas, sardines, pumpkin leaves and African spinach (Doodo) as a sign of poverty and low status. They spend money on tinned Western foods, meat and eggs, because they are eaten by educated people. They think that sweet bananas, pawpaws, guavas and passion fruit are for the children only. They are unaware of the value of fruit to their health.

Some people still drink unboiled water and milk because they lack knowledge of their harmful effects. They despise eating locally-available animal protein such as flying ants, edible rats and locusts because they fear that they will be laughed at, while those who laugh at them eat things like frogs and snails! Rural people tend to sell the best food they grow to town people, leaving the remainder for their family. This is primarily because they need the money for school fees. They do not realise that a child who is malnourished is intellectually and physically retarded, and can waste a lot of money by repeating classes. If meat is available, this is eaten by the adults, while the children have soup. This is because they do not know that children need meat while they are growing even more than adults.

Another more important nutritional factor is that many village people still live under the influence of superstitions and taboos. For example, many girls and pregnant women do not eat eggs, poultry and some type of fish for fear that they will become sterile, or give birth to babies resembling the fish or animal whose meat they ate.

In Uganda, the months of May, June, November and December are ones of plenty, when harvesting takes place. During this time it is distressing to see fruits such as mangoes, oranges and sweet bananas rotting. Vegetables and cereals are also spoiled by weevils, rodents and other pests. This is because there is a limit to what people can eat during the harvest season, and they do not know how to preserve or store extra food by, for example, bottling. Also rural people do not know how to cook properly. They thoroughly cook things like carrots, cabbage, tomatoes which should be lightly cooked, and they lightly cook things like pork which ought to be cooked thoroughly. They also do not know how important it is to wash their hands before preparing or eating food, or about the need to wash fruit. The consumption of stale or spoiled food is also widespread.

These are the most common causes of malnutrition in Uganda. When adults or children suffer from malnutrition, the country suffers a loss in productivity which comes from its most important resource, the people. This is because people who suffer from diseases such as kwashiorkor, marasmus, anaemia and keratomalacia become weak and tire easily.

I would now like to turn to the subject of rural development. I am thinking of the term in the broad sense of satisfying the needs of the majority of rural people, rather than that of economic indicators such as gross national product. People need to have employment, to eat properly, and to have access to basic education and health services. They will then be happy, healthy and productive. We in Uganda are aware of the importance of lack of knowledge about food in the rural areas, and have tried to solve the problem in a number of ways which I would now like to share with you.

First of all we realise that teachers in the rural community are highly respected members of their communities. Teachers bring together pupils in formal education and adults in the non-formal education sector. They come into contact with pupils who are the mothers and fathers of tomorrow. A teacher's role now includes organising education activities both for young people out of school and for adults. They are not solely concerned with children in the classroom. Teachers need to have training in nutrition education so that they can spread a knowledge of nutrition throughout the rural community.

It was for these reasons that a project called the Namutamba Project on Education Integrated into Rural Development, was started some years ago at Namutamba Teachers' College. It is now called The Basic Education Integrated into Rural Development Project. It was supported by Unesco and the Government of Uganda to develop a curriculum which would be relevant for all who attend school, and to their community. I am now its director, having taken over from the Unesco expert who started the project.

The Project aims to provide functional literacy, general education, craft skills and health education for school children, young people and adults. Nutrition is regarded as a particularly important part of the teacher training curriculum. An attempt is being made to bring about integration in a number of ways. These include integration between:

- theory and practice in the school curriculum,
- different subjects of the curriculum,
- the school and the community,
- the formal and informal sectors, and
- various departmental services of Government.

From the very beginning of the Project a study of food and nutrition was included as a compulsory subject in the teacher training and primary school science curriculum. This was to ensure that teachers as well as pupils acquire a sound knowledge of nutrition, so that they can spread it to others in the rural community. Among the subjects included in food and nutrition were:

- The nutritive value of proteins, carbohydrates, fats and vitamins, the effects of malnutrition. Role of mineral salts and water.
- How to get food; growing food; food as a source of energy.
- Basic methods of cookery: advantages and disadvantages of these methods. Methods of food preservation.
- The choice and cost of seasonable foods with emphasis on local food.
- The planning, preparation and serving of a day's balanced diet for the family.
- Special diets for infants, sick and old people, and on various occasions.
- Economy in the kitchen - care and use of left-overs.

Student teachers are taught in the way we would like them to teach. This is by integrating theory with practice. They carry out practical work by, for example, cooking various foods and letting the pupils do the same. In the past, teachers talked about such things as balanced diets, and the need to filter water, without doing it practically. Pupils memorised definitions, and learnt about food tests, and duly reproduced this information in examinations. Because the theory was not applied in practical situations, they regarded it as 'school knowledge' rather than 'useful knowledge'. Our approach when teaching about the importance of having a balanced diet is to get pupils to plan the meals, then to cook, serve and eat the food, and finally to carry out an evaluation. In this way, nutrition can be a very enjoyable subject, especially in primary schools and in teachers' colleges.

The Project encourages use of the local environment. When teaching nutrition the school makes use of foods which are available locally, and teaches about their nutritional value, how they should be prepared, produced, preserved and stored, and why they are better than imported foods.

Nutrition which is taught practically requires, of course, cooking and other materials. The local environment is explored to obtain materials such as tins, charcoal, firewood, stoves and pots. Teachers and pupils make charcoal stoves, improved fireplaces and tin ovens. This equipment is then used for baking, cooking, frying, roasting, serving and preserving food. This is mostly done with local food and materials, because these are the ones available in the rural envrionment, rather than gas cookers, refrigerators and electric cookers.

Efforts are being made to integrate the school with the community. In the past, schools tended to isolate the child from his community and his environment. This made him regard the school as a strange institution which had nothing to do with his home. There was little transfer of knowledge acquired at school to the child's home or vice-versa.

Teachers are encouraged to survey pupils' nutrition activities at home. Activities include making vegetable gardens at home, growing and eating fruit, preserving and making food stores, the care of left-over food, practising sound eating habits, boiling and filtering water, planning, cooking, and serving balanced meals. The teacher organises adult nutrition groups at school. Parents, teachers and pupils take part in festivals, such as on Namutamba Day, when they all join in preparing a balanced meal. They enjoy doing this and it provides an incentive to good nutrition.

In order to bring about an integration between the school and the community, pupils and teachers visit different nutrition areas. They visit homes near the school to identify cases of malnutrition and to study their causes and try to find a remedy. Serious cases are sent to higher nutrition units such as the Mwanamugimu Nutrition Unit at Mulago Hospital, Kumpala, to be treated. The mother is given instruction to avoid reoccurrence.

Medical students from Makerere University visit the Project to share their experience with ours in fighting malnutrition. Community development workers, health visitors and teachers work together in an attempt to minimise malnutrition.

Evaluation of nutrition takes three forms. There is the continuous evaluation done by considering weekly performance and records through the year. Secondly, there are terminal examinations, and thirdly the effect of nutrition knowledge in the community is assessed.

There is no doubt that our approach has reduced malnutrition in the community. Now that it is being spread to other parts of the country, we hope that malnutrition will be reduced so that people in rural areas can develop their areas and improve their quality of life. We are not, of course, suggesting that our approach is applicable universally. Each country has its own problems. In some, there is an overall shortage of food and the need then is to find ways of increasing food production. Where there is real poverty, so that parents have to sell all their best food to pay school fees, the solution must be to eliminate or minimise poverty. Where the cause is lack of peace, so that people become unsettled and are not able to grow enough food, peace must be sought. In Uganda, where the primary cause is lack of knowledge about food, the solution lies in training the teachers to spread knowledge of nutrition. The inclusion of nutrition education in the teacher training curriculum is a matter of vital importance in working for a healthier future.

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4.6 Recent Trends in Nutrition Education in Sudan

by

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The Sudan is the largest country in Africa with an area of one million square miles and a population of about 18 million making it one of the least densely populated countries in Africa. It has a good potential for agricultural and food production thanks to fertile soils, suitable climate and water sources. The amount of food available per capita is reasonably good. Although nationwide food consumption data are not yet available, it would appear from several surveys (e.g. Khattab and El Hadari, 1969 and 1972) that a fairly balanced state exists, especially in relation to calories and good quality protein. Nevertheless, a large sector of the population in Sudan, particularly infants and children, suffer from malnutrition. The solution to this problem lies in nutrition education, and there is now a growing interest in teaching food science and human nutrition at various levels in order to make the maximum use of the available food. Currently nutrition education in Sudan is provided by a number of agencies, including the Ministries of Health and Education.

The Ministry of Health Nutrition education in the Ministry of Health is the responsibility of the Nutrition Division, which was established in 1966. It is responsible for the disseminating of nutrition knowledge nationwide. This is carried out through teaching in many of the post-secondary school establishments, such as the Faculty of Medicine and Faculty of Education (University of Khartoum), the Khartoum Nursing College and the Ahfad University College for Women. Teaching is done on part-time basis. The courses offered are of wide coverage and emphasize the practical aspects of nutrition.

Nutrition education of the public is partly carried out by the Nutrition Division. This is done through education of mothers in Maternal and Child Health Centres. Nutrition education through the Nutrition Rehabilitation Centres has been developed considerably in Sudan. This involves convincing mothers of children who are showing signs of malnutrition of the importance of feeding them properly. Some hospitals have special wards in which malnourished children are treated by means of balanced feeding. The mothers are allowed to monitor this feeding under expert supervision. This gives them practical training in nutrition.

Ministry of Education This Ministry also plays an important part in nutrition education in Sudan. A Nutrition Training Centre was established in Khartoum for training the following personnel:

- Primary school home economics teachers,
- Intermediate school home economics teachers, and
- Young women who are then assigned to adult education, community development centres or kindergartens.

The nutrition education programmes offered by the centres aim to impart basic information and to demonstrate methods of preparing locally available food stuffs. The Ministry of Education also offers courses on food preparation and home management in girls' schools. This training is also available at diploma and B.Sc levels.

Ministry of Agriculture The Ministry of Agriculture, through its extension department, has a major interest in human nutrition. It has the task of interesting farmers in growing more and better quality food both for home consumption and for sale. It also helps farmers to improve methods of storage and techniques of marketing. The extension department also gives advice on ways of improving food habits. Extension teaching in nutrition is done on farms and in a variety of clubs. Teaching aids used include the written word, projected aids, radio, charts, posters and exhibits.

University of Khartoum There is no department of Human Nutrition in the University at present. However, nutrition is taught in the faculties of Medicine, Agriculture and Education, the emphasis depending on the discipline. The Faculty of Agriculture, for example, emphasises the relationship between agriculture, food and nutrition, and the disorders associated with poor diets.

A University College for Women (Ahfad) offers a nutrition course at a diploma level in the School of Family Sciences. This makes potential mothers aware of the value of nutrition in teaching it to other people. In addition, the Faculty of Agriculture offers short courses in nutrition to primary and intermediate school teachers.

All these institutions help in disseminating nutrition knowledge to the public by means of radio, television and the press, as well as through exhibitions and shows. This has had a marked effect on the nutrition knowledge of the public.

Conclusions

It is clear that much effort is expended in teaching and training in nutrition in Sudan. This takes a number of different forms. Until recently there has been a lack of coordination between the various bodies which deal with nutrition. Recently a Sudanese Nutrition Society has been established; one of its aims is to coordinate nutrition education activities offered by various institutions. The experiment of establishing Nutrition Rehabilitation Centres has been successful. There is now a need for more centres throughout the country to care for more malnourished children. The international agencies have played a valuable part. Considerable progress has been made in teaching institutes in Sudan, although mnuch remains to be done in the future.

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4.7 FAO Experience on Methods of Introducing Nutrition in Schools and Colleges of Agriculture

by

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The Food and Agriculture Organisation of the United Nations (FAO) is one of the specialised agencies of the United Nations family. The 152 member nations of FAO have pledged themselves to three main tasks: to raise levels of nutrition and standards of living of their peoples; to improve the production and distribution of all food and agricultural products and to improve the condition of rural populations. Within the FAO, the Food Policy and Nutrition Division has, as its main objective, the assisting of member nations in taking the necessary action to combat hunger and malnutrition. The activities of the Division include assistance in assessing the food and nutrition situation; in appraising the nutritional impact of agricultural rural development and food aid projects; in planning and implementing nutrition interventions and in establishing or strengthening the national infra-structures in support of nutrition planning, interventions and food control. Nutrition education and training is one of the most important action programmes of the Division. Projects for the training of staff in developing countries at all levels have been assisted by the Division for many years. The experience has covered training in nutrition for staff in the fields of education, agriculture and health. The Division has devoted increasing attention throughout the years to the training of agriculturalists in food and human nutrition at various levels. Agriculturalists have an increasing role to play in alleviating malnutrition, since they are responsible for the production of food, and therefore they should be aware of the implications that their advice and activities may have on human food consumption and nutritional status, which in turn influence the quality of life and economic development of people. As the main source of nutrition advice to the World Food Programme, FAO has also assisted countries in training their national staff in the management of group feeding programmes.

The discussion which follows is limited to the description of the methodologies and approaches utilized by the Division in nutrition training in agriculture, which may be useful for future action by those concerned with teacher training. The methodologies for introducing nutrition into pre-service agricultural education are described in a number of FAO documents which provide guidelines for curriculum content. These guidelines are designed to help teachers present the subject of food and nutrition in a manner relevant to students of agriculture, so that they come to recognise their responsibilties in improving nutrition through increased or improved food production, supply and distribution. The training provides the students with opportunities to acquire the knowledge and skills required to design and introduce nutrition considerations, including selected interventions, into agricultural and rural development projects. The material was originally prepared and adapted for intermediate level agricultural education (diploma and certificate levels).

Two alternative approaches are proposed:
Option A, which is the addition of a separate course on Food, Nutrition and Agriculture, and
Option B, which is the inclusion of food and nutrition concepts into agricultural curricula at appropriate places.
Institutions wishing to include the subject in their curricula could choose between these alternatives or use a combination of them.

Option A consists of a course, lasting for perhaps one term. For adequate coverage of the content, including theory and practical experience, it is suggested that 12 to 15 one-hour lecture periods, and from 30 to 45 hours of practical experience and problem-solving exercises in 3-hour blocks would be appropriate. The course is organized in eleven topics of unequal weight, so that time should be shared among the topics according to what is needed to reach the students' performance objectives.

Option B requires a thorough review of all subjects in the curriculum, and the identification of those areas which have relevance to human nutrition. Some subject syllabuses will be unaffected or be subject to minor changes. But others would lend themselves to the inclusion of food and nutrition elements and to the broadening of the students' understanding of human food and nutrition problems. The FAO guidelines identify seven such subjects in agricultural curricula, examine the syllabus content for each, and indicate the appropriate places for inclusion of specifically identified nutrition aspects.

A difficulty with Option B consists in giving a unity to the food and nutrition teaching which could, however, be overcome by organising a two-day seminar during the last school year, involving students, the teachers most concerned, and a nutritionist. A case study could be produced which would explore ways of introducing nutrition into rural development projects. Option A would require a trained nutritionist, fully responsible for its development, whereas Option B would require a team approach, the training of the staff dealing with various disciplines, besides the technical support of qualified nutritionists who might also need to play a coordinating role. Option A may prove easier to implement than Option B, but both Options emphasize the practical aspects of teaching in the field.

To support and exemplify the guidelines, FAO, in cooperation with USAID, has prepared teaching aids, consisting of a textbook, a teacher's book and a student's book, which are now being tested in a number of countries. To assist countries to introduce the subject of food and nutrition into agricultural curricula, the Division holds both regional and national workshops. The workshops offer a good opportunity for the participants to discuss the appropriateness of the guidelines own individual countries which they are encouraged to adapt to local conditions. This approach involving regional and national workshops has been adopted by ESN/FAO in recent years for training national staff in group feeding management. It has proved to be very successful, since it helps to create interest and cause a chain reaction, facilitating the follow-up at various national levels by an international agency. In the case of nutrition training in agriculture, regional workshops have already been held in the Far East, Africa and Latin America.

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4.8 Nutrition Training of Community Health Workers

by

Kalyan Bagchi

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In most developing countries, promotion of nutrition at the community level is an important responsibility of all types of community workers. Thus, community health workers, agricultural and women extension workers, social welfare and community development workers, all have a responsibility for promoting nutrition and preventing malnutrition. These are normally specified in their job descriptions. How seriously they are taken in practice is a matter which is arousing interest and concern among programmers and administrators involved in nutrition promotion. It should be emphasised that in almost all developing countries, no sectoral community workers have nutrition promotion as their sole or even major responsibility. They have other more important tasks for which they are responsible. The main responsibility of primary health care workers is to provide medical care in the community. With the exception of supplementary feeding, nutrition services are often not regarded as a prime need of the community, and the association between nutrition and ill-health is frequently unrecognised. The role of the community workers in the field of nutrition is a difficult one. The ability to communicate with members of the community is essential.

It is obvious that in order to enable community works to shoulder their responsibility, adequate training is essential. Such training should not only aim at imparting additional knowledge but should emphasise the techniques of communication and of knowing the community, and more specifically, the methods of acquiring skills needed to perform appropriate tasks. In other words, the training should be thoroughly task-oriented and of a problem-solving type. It often happens that knowledgeable community workers get confused when faced with practical nutrition problems. Their training may not have adequately stressed this aspect of their work. When for example, a community worker has a malnourished child, he or she should at once think of a series of solutions and be able to select the right one. Thus, the solution of malnutrition in a child is not only to impart nutrition to the mother. Other factors such as a malnourished pregnant mother unable to take proper care in the feeding of the child or chronic diarrhoea, which is commonly overlooked, need to be considered. The training of community workers in nutrition should be based on such problem solving approaches.

In the past, the peripheral workers who were in contact with the community were trained in a conventional manner based on lectures. With the adoption of primary health care systems, considerable attention is now given, in most developing countries, to rationalising nutrition training of the peripheral workers. As a result they have become key persons in delivering nutrition services to millions of people who live in areas barely reached by national health care services. A large number of manuals, guidelines and training packages are being developed in various countries. There is also considerable interest among international and bilateral agencies in providing this sort of assistance to individual countries.

Since 1977, the World Health Organisation has been making continuous efforts to rationalise the nutrition training of peripheral workers. A series of workshops with national trainers from about eighty countries has revealed several important factors. For example, the trainers of community workers in nutrition in most developing countries come from various disciplines e.g. doctors, nurses, sanitarians, health assistants ahd lady health visitors. In almost all cases, the trainers, while competent in their profession, are not skilled in the techniques of training. Often they are unaware of the precise tasks their trainees will need to carry out, and of the conditions under which they work.

It is against this background that the WHO, as a first step, has carried out a major review of the nutrition and nutrition-related tasks of the community workers in the developing world. The pattern that emerged is more or less the same everywhere. The auxilliary nurse midwife in Burma, the midwife and the community health nurse in Malaysia, the multipurpose health worker in India and the primary health workers in most African countries all have to tackle similar problems. They are all involved in:

- knowing the community
- growth and nutritional monitoring of infants and young children
- promotion and protection of breast feeding
- nutritional care during weaning period
- nutritional care during pregnancy and lactation
- management and prevention of specific nutritional deficiencies, and
- nutritional care during diarrhoea and common infections in children.

The training methods in nutrition should therefore clearly lay down learning objectives based on these tasks, for which task-analysis is essential. The training content for understanding these tasks - which is the knowledge component of the training - should be limited to that which facilitates an intelligent understanding of the tasks. The most important component of the training programme should consist of the selection of training methods which would permit the trainees to acquire the necessary skill - manual, communication and cognitive - to perform the tasks. This is the weakest part of existing training programmes in most developing countries. The stages through which adequate training guidelines were developed by the WHO were described earlier (Bagchi, 1981). In 1981, the Guidelines for the training of community health workers in nutrition were published in English (WHO, 1981). During the last three years, as a result of national demands, the document has been adapted and translated into many other languages. Since the guidelines are primarily designed for trainers, the revised edition of the document, which is under preparation, is being modified to make it more useful by, for example, incorporating a chapter on simple rules for better teaching. The revised edition will also have an additional module on the technique of decision-making from different options.

Future strategy

While there is considerable interest among the international and bilateral agencies in the training of professional nutritionists, the training of intermediate and peripheral workers in the field of nutrition is of relatively recent interest. However, it is now being increasingly realised that ultimately the delivery of nutrition services to those of the population who need them most will depend on:

1. Adequate training and motivation of community workers who are in the first line of contact between the community and the government sectors to which they belong.
2. Adequate technical support and supervision from the intermediate level workers. These are incidentally the trainers of the community workers. It should be confessed that adequate training of this level of workers is most often a neglected area except in the case of the nursing professions. Without adequate training at this level, the effectiveness of community workers will be greatly limited. The WHO recognises that the

nutrition training of health officers, public health nurses, health assistants and lady health visitors should receive increasing attention, and has made plans accordingly.

In developing a more effective strategy for the community health workers, greater attention will have to be paid to identifying one or two nutritional tasks which will form the core of their nutritional responsibility. Through research and field trials in a number of countries, it has been observed that growth monitoring of infants and young children with Growth Charts, if properly carried out, can indeed be the most crucial nutritional task in the community. This will not only help the worker to identify those children who are at risk and to whom most attention will have to be given, but will also establish a closer link and rapport with the community which will facilitate other nutrition-related tasks like immunisation, oral rehydration and birth spacing.

The second task which should occupy an important place in nutrition training is the skill and knowledge in communicating appropriate messages to mothers relating to infant and young child feeding and care. This is nothing new, and in fact, nutrition education in these areas has been the most commonly implemented intervention in most developing countries for years - but with what result? Without a clear understanding of why the mother does what she does in child feeding and care, messages based on general conclusions and presumptions are not going to make any significant dent on the problem of child malnutrition. This is an area which needs urgent research, not only for making nutrition education more realistic and effective, but for a better understanding of the immediate causes of malnutrition, and to develop more effective steps for their amelioration.

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CHAPTER 5

NON-FORMAL APPROACHES

The papers in this chapter highlight the fact that schools are part of the community and are closely involved in non-formal education. This is clearly illustrated in the papers by Prem Khanna and Rosalina Villavicencio which describe education projects in India and the Philippines. Other examples of this integrated approach to education are also described in Chapter 6. Nutrition education needs to be seen as a unified whole, in both the formal and non-formal sectors. Communication between governments and the community, doctors and patients, and teachers and pupils is of paramount importance if nutrition messages are to be conveyed effectively.

Valuable work is done by those teachers who are involved in education in the community; both O. Keshinro and Sajeet Malhan make a number of valuable suggestions for ways in which nutrition education within the community could be improved. Nutrition, as part of development education encompassing both industrialised and third world nations, is discussed by Joan Allen Peters. Education, particularly of young people, should lead to a greater understanding of and participation in local and national development, leading in turn to improvements in nutritional status and knowledge.

One of the most significant developments of the twentieth century has been rapid industrialisation and urbanisation, often accompanied by problems, such as the growth of urban slums. Industrial growth has frequently increased the size of the female urban workforce. Pat Harman discusses the importance of nutrition education for working mothers in this context.

Contributors

5.1	Prem Khanna	Nutrition education in non-formal education systems in India
5.2	Rosalina Villavicencio	An agriculture-based nutrition education programme in an upland community
5.3	Sajeet Malhan	Nutrition education in integrated child development programmes in India
5.4	O. Keshinro	Nutrition education of the public
5.5	Joan Allen Peters	Nutrition as part of a development education programme

5.6 Patricia Harman Wage-earning mothers - opportunities for nutrition education

5.7 Workshop discussion

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5.1 Nutrition Education in Non-Formal Education Systems in India

by

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The universalisation of elementary education has been assigned a high priority in India, as it is an essential component of the Minimum Needs Programme of the Sixth Plan. Recently, it has been pursued energetically to make it as effective as possible. A national committee on elementary education has been constituted for this purpose, and non-formal education for children of elementary school age has also been put in hand.

Concerted efforts are being made to set up non-formal educational centres, both at primary and middle levels, to develop non-formal education as a complementary and supportive channel to the formal system of education. This is particularly important in India, where a large number of young people receive little or no formal education. Nearly 70 per cent of children in the 9 - 14 age group either do not enrol in schools, or discontinue their education before they reach the age of 14 years. These children are busy in household work or helping their parents to earn bread for the survival of the family.

The problem of many young people staying out of school has reduced the significance of the increase in enrolment in schools. A number of measures have been suggested to bring about some improvement in the current state of affairs:

- Reforms, such as an ungraded school system up to class VIII, and conversion of single teacher primary schools into two teacher schools.
- Setting up early childhood education centres in rural areas as adjuncts of primary schools.
- Setting up a large number of non-formal education centres for children who cannot join the formal schools due to socioeconomic constraints.

Almost all the children educated through non-formal education belong to the weaker sections of society. These children do not have time to study in formal schools, as they are obliged to support their families. In India, non-formal education should not be thought of as an inferior education for economically weaker people. In fact, it has parity with the formal system in terms of the curriculum. The main difference between the two systems is that in the non-formal sector, the duration, curriculum and methods of teaching are highly flexible compared with the formal system. Also, the emphasis is more on 'learning' than on 'teaching', and as the non-formal education is imparted in the child's own environment, it is more relevant to his needs and aspirations.

Nutrition education in non-formal education

Before discussing the various components of nutrition education in the non-formal curriculum, it is worth noting that each non-formal centre is like a part-time school managed by a single teacher. Each centre functions for nearly three hours per day. The physical facilities are a bare minimum. The teacher is required to teach the entire curriculum besides doing other activities necessary to keep the centre alive. The main emphasis is on functional literacy, elementary mathematics, and general education relevant to the child's day-to-day problems. The nutrition part of the curriculum is linked with health education and environmental cleanliness. Its major components are:

- The human body, functions of different parts of the body, such as the respiratory, digestive and circulatory systems.
- Common ailments of eyes and ears. Their protection against defects and diseases.
- Nutrition, components of a balanced diet, functions of each component, deficiency diseases, malnutrition and its effects.
- Environmental cleanliness, air and water pollution, harmful effects of pollution.

The role of non-formal teachers

Turning now to the role of teachers in the non-formal sector with regard to nutrition education, it should be noted that:

- The non-formal teacher plays a vital educational role in the village or urban area. He is in direct contact with the families of local people and this is his first priority in establishing and running the centre. Once the centre is started, this contact is maintained through the children. If the teacher is properly trained in the field of nutrition, he can be effective in transmitting nutrition messages, as he is aware of the locally available food stuffs and the constituents of the diets of the village population.
- Children studying in non-formal education centres are drawn from diverse socio-economic backgrounds. The parents are generally illiterate and ignorant about the choice of food and how it should be cooked. Food is selected on the basis of its local availability and taste. No one bothers about its nutritional value. And, much of its nutritional value is lost because of traditional methods of cooking. The non-formal teacher has to motivate and guide people to change their food habits and cooking methods. This can bring about a marked improvement in the nutritional status of the children of the centre. To achieve this, he may require the help of voluntary agencies and locally-available para-medical resources. It has been observed that the occurrence of malnutrition is not always due to the lack of nutrients, but due to lack of knowledge. Fish and poultry are important sources of animal protein. There are many villages which could establish poultry-keeping on a co-operative basis and the

non-formal teacher is able to provide valuable guidance and suggestions on how this might be done. If there is a pond in the village, it can be used to produce fish to meet basic nutritional requirements.

The training of teachers

Several governmental and semi-governmental agencies are already working in cities and villages to promote nutrition education in the community. Non-formal teachers must be trained to seek help from such agencies, as well as guidance and co-operation from people involved in such programmes including school teachers, agricultural extension workers, village and home workers. Women teachers can be trained to look after the special health needs of women with the help of female village workers. The purpose of training should be to bring about a change in the attitude and outlook of the trainees and to impart knowledge and skills related to health and nutrition. It is worth noting that non-formal education teachers are not expected to have much laboratory experience, but they are called upon to play a vital role through their contacts with the people in creating a favourable atmosphere for receiving nutrition messages. Therefore, non-formal teachers should know about nutritional principles and have some understanding of supplementary and substitute foods.

In conclusion, it is of great importance that nutrition education be provided in the informal and non-formal sectors of education, particularly in those rural areas which do not possess formal schools. Teachers in the non-formal sectors need training in how to communicate, so that they can explain to people how to improve their nutrition within the context of their culture.

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5.2 An Agriculture-based Nutrition Education Programme in an Upland Community

by

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The nutrition education programme for upland comunities in the Philippines is an example of how formal, informal, and non-formal systems of education are related to each other in a logical network. I would like to emphasize that the study I will describe is a pilot project involving two upland communities. The team of researchers tried to implement what most anthropologists, led by Margaret Mead, have proposed, that is, the desire for change must come from the whole population. The communities' ideas of how the change can be carried out should be given serious consideration, for they know the leadership structure and temperament of the community.

The International Environment Education Programme (1975) states that the goal of environmental education is to develop in learners an awareness of the environment and its associated problems, and to give them the knowlege, skills, attitudes, motivation and commitment to work individually and collectively towards the solution of current problems and the prevention of new ones. The Philippine Environment Code which took effect in 1977 provided for a policy on the protection of the environment. To ensure that citizens understand the importance of environmental protection, the Code authorised the Ministry of Education and Culture to direct institutions: (1) to integrate subjects on environmental education into school curricula at all levels, and (2) to conduct special community education programmes emphasising the relationship of man and nature.

The objectives of the International Environmental Education programme, the policies of the Philippine government on environmental protection and the interest of the government on countryside development shaped the initial ideas that led to this research and development project with the aim of adapting science and technology to the local environment. In 1977 the Biology Workgroup of the Science Education Center in the University of the Philippines initiated a community-based science and technology education project to make use of natural resources and real-life situations for the learning of science concepts in order to improve the economic and socio-cultural activities of the community. The long-term aim of the project was to develop an understanding of ecological relationships in young and adult members of the community to help them to take appropriate action to ensure a healthy and stable environment. Although the main aim of the project was to protect the environment, the preservation and maintenance of a healthy human environment was also seen as important. Thus, health and nutrition as an aspect of the science and technology education project was included.

Methodology Used

The initial method used to collect data for the project employed the anthropological technique of participant observation. This called for five or six researchers to live in the village three or four days each month until they become part of the village. The first visit was carried out with the participation of the principal of the elementary school to establish the credibility of the project and to assist in building rapport between the researchers and the villagers.

A survey of needs and resources is the first step in understanding the community. The scheme of observation included parameters on village economic activities, community structure, health and nutritional status, natural resources of the community, and on the extent of knowlege about the environment. Earlier studies had shown that the villagers were highly suspicious of strangers; hence, note-taking and tape-recording of responses were ruled out. Instead, spontaneous and person-to-person comunication were used, basing queries on the parameters of the scheme of observation. The survey was followed by a free clinic for two days and a nutrition status survey of children from several months old to twelve years of age. Data about the health of individual families was collected during the free clinic. Some pertinent data on the medical history of the community, e.g. vaccination administered by visiting health officers, prevalent disease incidence according to age group, were taken from documents and records kept by the resident school teacher and the village leader, known as the barrio captain.

These enquiries threw light on the following questions:

- What are the common illnesses related to the nutritional deficiencies prevalent in the village?
- What strategies may be designed for the nutrition education programme?
- Is there local manpower whose capability may be useful for the implementation of the programme?
- What is the role of the community experts in this programme?
- What system or institutions may be used to initiate the programme?

As a result of this work ideas were generated on the scope and design of the nutrition education programme as part of a larger project on integrated rural development. Topics on health and nutrition were listed in order of priority in view of the instructional materials that would be developed. Also a strategy on the integration of the instructional materials on health and nutrition with school and community activitiy was designed.

Background Information

The study sites of this project are communities in the foothills of the Sierra Madre mountain ranges and Mount Banahaw, both in the island of Luzon. To begin with, the physical and the human environments were investigated to establish the baseline data of the needs and resources in the community. The community is situated in the mountain range with a majority of the people living at about 450 metres above sea level on the eastern side where they are protectd from the strong west winds. It has a cool and healthy climate with some rains during May until early October. It is generally cool and rainless for the rest of the year. The land is used for the cultivation of vegetables and cash crops such as coffee, citrus fruits, bananas and rice. Very little of the land is used as pasture for livestock. In one community the major activity was logging by concessionaires. The main occupation is upland farming of cash crops. A household generally consists of a nuclear family. A young couple is normally helped by their parents to build their own house and given a piece of land to cultivate. The average number of children in a family is eight. The barrio captain and the council men elected by the people act as leaders in the village and provide a link between the government and the people. They are called to the towns for meetings on government programmes for countryside development.

An elementary school provides the primary level of education, which may be the only formal education which children receive. There is neither a clinic nor a permanently-assigned health officer. Medical assistance is available at the town ten kilometres away. The social organizations include the mothers' club, youth organizations and farmers' cooperatives.

During the free clinic, 118 community members representing 25 percent of the population came for consultation. The children were surveyed for parasitic infection and nutritional status using the arm circumference technique. There was a general indication of deficiency in protein-calorie intake; ten percent had iron-deficiency anaemia, and 0.02 percent goitre. Using the arm circumference method, 35 percent of the elementary school pupils showed early indications of nutritional deficiency. A general check-up of the eyes and skin indicated anaemia was common. The height and weight pattern showed most of the pupils were below the norm.

An Agriculture-based Model of Nutrition Education

An agriculture-based nutrition education programme was developed. It was considered important to start from an actual situation experienced by the people, and then to decide on a course of action after consultation with the villagers. The prevalent illnesses were made the starting point for education on nutrition. The researchers hypothesized that if the people could clearly see that:

- they could grow crops rich in nutrients needed for good health,
- livestock farming, such as raising goats and poultry and fish cage culture could be successful in their environment, and,
- that they could be taught improved farming and good methods of food preparation,

they would accept and accommodate the programme as part of their daily life.

The resource assessment revealed that the nutrition problems could be alleviated by harnessing the available physical and manpower resources in the community. The following activities were conducted before the programme was started:

- meetings with leaders and pressure groups in the community to inform them of the programme, obtain their support and agreement on the modalities of action,
- meetings with men and women in the village to define aims and decide on their roles and participation,
- choosing of members who could be delegated to receive seedlings and training on plant propagation,
- the solicitation of assistance and resources in the form of selected seedling varieties and competent technical services from government institutions such as the University of the Philippines, College of Agriculture and the Bureau of Plant Industry regional offices.

Nutrition Education in the Upland Village

Several modalities of action were undertaken. The first involved the assistance of the Bureau of Plant Industry Economic Garden at Los Banos, Laguna, in the distribution of seeds and seedlings to the families. A farm technician was available during the distribution when a seminar *cum* workshop on plant propagation was also conducted. The following seeds and seedlings were distributed:

1. Rich in iron: malunggay seedlings (a legume), pechay, peanuts, pole sitao (green beans), guava, jackfruit, okra, squash.
2. Rich in carbohydrates: corn, sorghum (used as feed for cows)

3. Rich in protein: mung beans, pole sitao, malunggay, peanuts, soybeans, winged beans, cowpea
4. Rich in vitamins: mango (vitamin A and C), papaya (vitamin A), corn (vitamin A), guava (vitamin C), grafted lemon (vitamin C)

The resident teacher helped in collating food preparation methods for the new crops. The teacher and the researchers developed instructional materials related to food preparation and the nutrients in food. The pupils diagnosed as suffering from anaemia and protein deficiency were given special attention through home visits by the teacher. In addition, a cooking demonstration conducted by an invited home economics teacher was done for the mothers' club.

The second modality involved the raising of poultry and swine, backyard cattle fattening and goat raising. Due to the high birth rate, the researchers considered that goat's milk was a good substitute for mother's milk and a necessary item in the diet of growing children. A seminar-workshop was held on alternative and econmomic methods of livestock raising which would lead to self-sufficiency in food; this utilized well illustrated materials developed by the researchers. Fish cage culture was introduced to make use of the stream that traverses the village. The initial training for fish cage culture was undertaken as a project in science by the Grade V and VI pupils. A dug-out pond in the school yard was used as the fishpond and several fish cages were installed in the stream near the school. A module on the biology of Tilapia and carp emphasising their feeding and growth patterns was developed as an accompanying text for reference. Parents were invited to look at what had been achieved and to see a demonstration on fish preservation by salting, drying and smoking.

The third modality of action concerned the integration of the information in the modules into the science curriculum at the primary level. It was pointed out that the school is an excellent entry point for ideas of change.

In the non-formal and informal systems of delivering information, the seminar cum workshop on farming techniques, accompanied with handouts and discussion and the sketches on food preparation developed by the mothers' club, were effective in sustaining the interest of the villagers on the action for change. They also served as a reinforcement on efforts already started.

Now, the project is in the hands of the local leaders. All communities possess a considerable store of knowledge that has been transmitted from generation to generation, experienced and fashioned by reason. The mores, beliefs, ways of doing things, and communication patterns are referred to as the culture of the society. In this project the cultural base of the community was used as the starting point and nucleus of the science and technology education programme in health and nutrition. The researchers hope that human development has occurred through this project in the way Brofenbrenner (1979) defines developmental validity of an experiment on human development. He states that: "To demonstrate that human development has occurred, it is necessary to establish that a change produced in the person's conceptions and/or activities carries over to other settings and other times."

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5.3 Nutrition Education in Integrated Child Development Programmes in India

by

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During the International Year of the child in 1979, it was realised that continuing neglect of children, particularly those belonging to the underprivileged sections of our society, would not only affect future generations but also jeopardise the very existence of our society. Every human being has the right to health. The existence of unhealthy children is not only an economic loss, but it also affects the development of human society.

Indian children constitute 14 per cent of the children in the world. Some 40 per cent of the Indian population is below 15 years of age, of which more than half live under conditions of deprivation. In 1951 there were 137 million children in India and by the turn of the century this is expected to increase to about 290 million. Malnutrition is a serious problem at various levels of society, particularly in the pre-school age group. Unfortunately India has a high infant mortality rate of 130 per thousand. Also the female child in India is still at a disadvantage as compared to the male child. The mortality rate for males is lower than the female mortality rate (Bose): the life expectation of a male child is 46.4 years, that of a female 44.7 years.

Apart from these demographic dimensions, there are other indicators which emphasize the need to pay greater attention to the well-being of the child. Realising the gravity of the situation, the Government of India has highlighted the need for introducing child welfare programmes in the Five Year Plans. The concept of integration of services for young children found acceptance in the Fifth Five Year Plan, and the Integrated Child Development Services Scheme was initiated as a pilot project in 1975.

The Integrated Child Development Services Scheme

The ICDS Scheme was conceived as an integrated programme, the major component being supplementary nutrition to children below six years and expectant and nursing mothers. Other services include health checkups, immunization and referral services, nutrition and health education and non-formal pre-school education. ICDS Projects are located in rural, tribal and urban areas predominantly inhabited by scheduled castes and tribes, and in drought-prone, backward and nutritionally deficient areas. To start with, 33 projects were started on an experimental basis in 1975-76, and there are now about eight hundred projects. It is expected that by the end of the Sixth Five Year Plan, one thousand projects will be in operation all over the country. The average population per project area is about one hundred thousand.

The Projects are based on units known as Anganwadi, each of which has a population of about 700 in tribal areas, or about 1000 in rural and urban areas. In rural and urban areas, there are 100 Anganwadis in a project, while in tribal areas a project has 50 Anganwadis.

The objectives of the ICDS programme are:-

1. To improve the nutritional and health status of children of up to six years old,
2. To lay the foundations for the sound physical, psychological and social development of the child,
3. To reduce the incidence of mortality, morbidity, malnutrition and school dropout,
4. To achieve effective coordination and implementation of the policy by the various departments to promote child development, and
5. To help mothers to look after the normal health and nutritional needs of their children through proper nutrition and health education.

To achieve these objectives, ICDS provides various services according to the needs of the target groups. For children of up to six years of age, expectant and nursing mothers, the package includes health checkups, immunization, supplementary nutrition and referral services. Nutrition and health education classess are available for all women of 15 - 44 years. Non-formal pre-school education activities cover children of 3-6 years of age. In addition, functional literacy classes for adult women are also conducted which lay emphasis on health and nutrition, personal and environmental hygiene, child care, home management and income-generating skills.

Nutrition Education

Preference is given to nutrition and health education for nursing and expectant mothers. A special follow-up is made of mothers whose children suffer from malnutrition and frequent illnesses. This education is imparted during functional literacy classes, home-visits by Anganwadi workers and paramedical workers, demonstrations of cooking and feeding, special campaigns at suitable intervals, mass media and other forms of publicity. The messages are communicated in local languages in the form of stories, folk tales, songs, plays and puppet shows, etc. Emphasis is laid on the communication of certain basic messages such as:

- Breast feed as long as possible.
- Introduce semi-solids from 5-6 months of age.
- Feed young children 5 to 6 times a day.
- Do not reduce food in illness.

Nutrition education is provided for mothers who come in contact with nutritionists, health personnel, medical and paramedical workers during their personal visits to the families and through mahila mandals.

Nutrition education needs to be simple, practical, realistic and appropriate, in order to remove ignorance, food fads and superstitions. Emphasis should also be laid on continuing breast feeding, supplementary feeding of infants, identification of malnourished children requiring special care, and proper methods of cooking, storage and the preservation of food. Nutrition education should be directed towards creating interest and awareness regarding importance of good nutrition among people.

Evaluation of the programme has indicated that the ICDS scheme has achieved some success in delivering supplementary nutrition, and primary health care services to pre-school children in rural, tribal and urban areas and that there has been improvement in the nutrition and health status of children, expectant and nursing mothers in ICDS project areas. The nutrition education component helps to develop skills for proper utilization of available food resources. Understanding is created of simple nutritional principles, and good food and health habits are encouraged. There is no doubt that although nutrition education is a slow process, it can bring long-term benefits. People can be helped to recognize their problems and find solutions using available resources.
The following are suggestions for strengthening nutrition education:-

- Students and staff of Home Science Colleges should be involved in imparting nutrition education.
- The ICDS functionaries should communicate informally with the villagers and pass on nutrition messages.
- At each Anganwadi, community centre and school building, posters depicting various nutrition messages should be displayed prominently.
- Nutrition consultants should guide the field level workers in imparting nutrition education.
- Use of demonstration methods in nutrition education should be encouraged.
- Food which has been cooked and served in temples may also be used as a medium of nutrition education.

- Cooking of food in community kitchens may also be used for imparting nutrition education.

In conclusion we should remind ourselves of the United Nations Declaration of the rights of the child and do everything we can to fulfil it.

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5.4 Nutrition Education of the Public

by

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The importance of nutrition education of the public should not be underestimated. It should form a major constituent of education programmes within developing countries, particularly where the literacy rate is still very low. This would help to change bad food habits where they exist within the community - for example reheating of soup pots, parboiling of vegetables. Such education could be achieved in a variety of ways, including the use of audio-visual aids in various types of gatherings, such as clinics and markets.

Effective nutrition education depends on instructors being able to explain to the people in a way which can be easily understood. People need to know certain basic things about nutrition including:

- What nutrition means. For instance, a highly tasty food or a favourite dish is not necessarily nutritious.
- The reasons why 'quality' food materials should be eaten. (Lathen 1965).
- The importance of cooking habits. (Keshinro 1980)
- The importance of good storage facilities in relation to the quantity and quality of food nutrients. (Oracca-Tetteh 1978)
- The need for sensible budgeting in view of the rising cost of living. (Olusanya et al 1980)
- The use of food in season lowers expenditure. (Olusanya et al 1980)
- Bulk purchasing should be an asset.
- Backyard gardening also reduces expenditure. (Olusanya et al 1980)

- The proper use of local foods reduces expenditure and it is also easily and readily acceptable. (Olayide et al 1972)

The nutritional problems of a country need to be handled by the cooperative efforts of government ministries, such as those of agriculture, education, health, community development, trade and industries. One of the practical solutions to nutritional problems is to improve the nutritional knowledge of the community. Ignorance is the fundamental cause of malnutrition in most developing countries, hence the importance of nutrition education. The following points are worthy of note:

- Nutrition education may be imparted not only in schools, but also in literacy classes in both rural and urban centres.
- The dissemination of nutritional knowledge can also be assisted by respected elders of the community. Such people should be prepared to eat foods which are nutritionally desirable, but which have been the subject of taboos. Here practical example is more effective than giving advice.
- The use of audio-visual aids, including the distribution of pamphlets and posters, illustrating nutritional materials in newspapers, magazines and on radio broadcasts and television if available.
- Actual demonstration of the preparation and cooking of food. This can be done by home economics teachers or by health nurses in health centres and clinics. This is of vital importance, as bad cooking may destroy valuable nutrients in foods. (Keshinro et al 1979).
- It is important to encourage nutritionally good traditional food habits, such as the consumption of edible insects and nutritious wild fruits.
- Discouraging undesirable food habits and taboos against the consumption of eggs, pork, snails, scaleless fish, for example, which are forbidden to certain people in terms of their age, sex or otherwise. Such foods are usually very nutritious.
- Teaching nursing mothers about weaning habits using only local foods. There is no need to shop for or cook weaning dishes separate from the main family dish.
- It is important to discourage advertisements promoting powdered baby milk in preference to breastmilk.

The community needs to contribute to improved agricultural output as a group or individually. The innovation of backyard gardens ensures readily available food materials and also fresh food through the production of vegetables, fruits, poultry goods, rabbit and pig rearing, either on a small or large scale, depending on the land space available. To ensure that food is not wasted, an efficient transport system from the farms to the cities is desirable. Within the family, it is important to give children a fair share of protein and other nutrients. Increased consumption of all foods, particularly protein, by pregnant and lactating women is vital because of their increased needs.

In Africa, the extended family is still very common and includes the parents of the couple, the aunts and uncles, the husband's sisters and brothers, the wife's sisters and brothers, the nephews and nieces of the couple - there is no end to the list. This obviously affects the pattern of food distribution within the family. The table below shows how food is distributed in households in the order of importance:

Husband (Man of the House)
↓
Husband's parents
↓
Husband's relations
↓
Sons
↓
Daughters
↓
Wife's parents
↓
Wife's relations
↓
Wife (comes last)

Children may not be receiving the amount and type of food they need to grow and develop properly.

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5.5 Nutrition as Part of a Development Education Programme

by

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Even the most optimistic and effective of nutrition educationors would at times suffer from feelings of despair when faced with the still widespread world problems of hunger and malnutrition. For in country after country there are the same hungry faces, the same injustices and inequalities, and the same mass media manipulation of food preferences. Food production is still not growing at the necessary rate in the poorest developing nations. Although there is enough food in the world to feed everyone, it never seems to get distributed fairly. After two decades of programmes in supplementary feeding, food enrichment, agricultural production and nutrition education, members of the development and nutrition professions are still unclear about how to tackle these problems. And because the results of such programmes have been largely disappointing, the proportion of the budgets spent by many development organisations on such nutrition programmes has actually been declining (Black 1982).

Perhaps in the past nutritionists set their sights too narrowly. Typically programmes involved education, child feeding practices, improved sanitation and increased food production. While they were undoubtedly planned with good intentions, and brought about some benefit, none of them brought about a significant change in the distribution of resources, food, wealth or income. They called for no alteration in the consumption habits of those already well-nourished. Nor did they call for a significant shift in the development priorities of either donor or recipient countries. Most nutrition education programmes have been based on the hypothesis that improved nutritional status would be achieved if people made better use of the resources already available. Behavioural change was expected from the malnourished persons themselves. But every nutritionist, if honest, faces moments of truth in which the solutions to hunger and malnutrition are seen to be elsewhere (Longacre 1977).

Why the hungry population keeps growing is primarily a political question. What happens to the food that is grown as well as the reasons why some non-essential crops are grown more extensively than other staples is not entirely determined by individuals, or even by individual countries. On a global scale, it relates to us all. If we accept this, and if we want to prevent our societies from outgrowing their food resources, or some groups from consuming a disproportionate share of the food supply, then we must begin to think in terms of a radically new politics of agriculture. We must refuse to accept inappropriate patterns of food consumption.

If, as Dumont (1980) says, the problem of hunger is more than that of poverty or simple environmental disadvantage, then we must focus on the constraints which allow this situation to persist. Food is basic to human survival. There is thus an obvious responsibility both to try to increase its production and to ensure that the supplies available are distributed in the fairest way. But such a redistribution of food resources related to a criterion of needs rather than controlling power will depend upon the establishment of meaningful and effective new policies involving rethinking not only the purposes of economic development but also of agriculture (Dumont 1980).

Those of us who live in industrialized societies can ignore for a time our dependence upon agriculture. We are insulated by the technology around us and the supplies of processed foods, to which we have almost unlimited access. Most of us eat more food than we need to maintain health, and this overeating predisposes us to diseases of affluence, such as heart disease and strokes. Only the very poorest members of our societies have insufficient resources to take care of their food needs. It is not coincidental that they are the least politically powerful members of our society.

Few regions in the world can live in isolation. A new politics of agriculture will demand changes in other related spheres, a revaluation of the exchanges between richer and poorer countries, an elimination of a global politics which entrenches poverty and is permanently divisive. Many people question whether the existing fora for international debate and action can meet these challenges. Perhaps we must wait and see. But what we should recognise now is that there are choices to be made, and that the constraints of population growth, environment and hunger are demanding that changes take place (Dumont 1980).

Development Education

If one believes that a changed political situation is fundamental to improved nutrition for the world's poor and hungry, where should one begin? One answer is in the field of development education, particularly for the young. If underdevelopment in the Third World, or in Canada, is an ongoing process rooted in history, it is maintained by economic and political structures. True development work must do more than simply combat the symptoms of underdevelopment. It must also seek to change those structures at home or abroad which impede real human development, including the achievement of nutritional well-being which is basic to a satisfying quality of life.

Development education depends on making information accessible to people, encouraging them to form moral and critical judgments and enabling them to participate in such changes as they believe appropriate, in ways appropriate to their own skills and interests. It involves their own development as individuals, as well as that of society as a whole. The objective of development education is to enable people to comprehend and participate in their own, their community's, their nation's and their world's development. Any process of development education must create a critical awareness of local, national and international situations starting from the perceived reality and perspective of the individual. Development education thus requires a close connection between the acquisition of knowledge and attitude formation which should develop a new political and social awareness leading to concrete action and commitment (Unesco 1974).

Development education in the programmes of Canada World Youth and similar nongovernmental organizations, is characterized as an ongoing process of reflection and action, action and reflection. Its purpose is to expose and work against those structurs which impede human development at home or overseas. In our use of the term development education, we combine assumptions about content, that is our understanding of underdevelopment, and methodology, our understanding of education (CUSO 1980).

Education is of course essential to both development and informed action. The values however of schools and curricula which reinforce the value system of the status quo deserve to be challenged. Education in its fullest sense is seen as giving persons the basic skills needed to function in a rapidly modernizing context (Stoesz 1977). Anthropologists view education and formal schooling as quite separate. For them education is a process through which one goes to become a full member of a culture. Education in these terms can exist quite independently of schooling (Read 1965). If schools are capable of developing intellectual curiosity, they can help their students find new ways of dealing with community problems. But if they see their job as primarily one of imparting basic knowledge, they may not be assisting them to contribute to the development of their community. Education in the anthropological sense must be a part of the development process in any country (Heisey 1977).

When education is defined merely as schooling, it is one of the roots of the development problems for any nation, developing or developed, which is struggling with the demands of a modern world. 'Our educational system should foster the social goals of living and working together for the common good. It has to prepare our young people to play a dynamic and constructive part in the development of a society in which all members share fairly in the good or bad fortunes of the group, and in which progress is measured in terms of human well-being, not prestige buildings, cars or other such things. Our education must therefore inculcate a sense of commitment to the total community.' (Nyerere quoted in Resnick 1968).

Canada World Youth Education Programmes

The widening gap between rich and poor, whether in a relatively wealthy nation like Canada or in a Third World nation, is increasingly apparent. At the same time, a high degree of interdependence among the world's people is illustrated by development issues such as energy, pollution, land use, and food production. To live in the world of today and tomorrow, we must develop tolerance and openness to values and to ways of doing things that may be foreign. We must be willing to become involved in the complex issues of development. In 1973, M. Jacques Hebert (now Senator Hebert) and a group of interested friends organized the first Canada World Youth exchange program. Their idea was to start with young Canadians in their late teens and have them live and work with young people from a Third World country in simple development projects in both countries. The programme was not aid, academic education or tourism. It was to be a programme of development education which would contribute to the process of development in both Canada and in the Third World. So far, more than five thousand young people have participated in these eight-month experiences. The funding is primarily from the Canadian International Development Agency. Expensive it may be but it has far-reaching value both to Canada and to the exchange country.

The objectives of the exchange programmes are to create a greater understanding and appreciation among young people. These young people are expected at the end of their experience to commit themselves to become actively involved in the solutions to local and global issues of development. We hope the participants will have a better understanding of the interrelationships of nations, and that they will work for improved international cooperation. After the programme, these young people are expected to return home to search with enthusiasm for appropriate indigenous solutions to the problems of development in their own country. Each exchange developed by Canada World Youth and a sponsoring agency in a third world country is based on the objectives of Canada World Youth with additional goals important to that sponsoring organization.

The Canadian phase of the exchange is launched with pre-orientation which acquaints participants with the overall goals of the programme. The actual experience begins about one month later when the Canadian and exchange country participants come together for an orientation camp. There they begin to learn about each other and to share their respective country's history, culture, language and concept of development. Groups of seven Canadians and seven exchange country participants are formed under the leadership of two professionals, one a staff member of Canada World Youth, the other from the exchange organization. These groups remain together for the duration of the programme. Group Leaders work individually with participants to establish their personal learning goals in development education, cultural understanding, personal growth and group skills. Periodic assessments of progress toward achievement of these goals are made in the middle and at the end of the experience.

After training camp, groups move into Canadian communities where they work for about ten weeks on their projects which are usually small rural or agriculture-related. Participants are often billeted with families and become deeply involved in both family and community life. They are also responsible for planning and presenting weekly educational sessions where the group explores local development issues, continues language training, and pursues cultural learning. They are actively encouraged to take part in the action-reflection style of learning and to evaluate their own progress. Prior to their departure from Canada they undergo orientation sessions designed to prepare them for the exchange country experience.

In the exchange country, the same type of community programme is undertaken. At the end of the whole experience, in both the exchange country and finally back in Canada, briefings and evaluation sessions are held to ensure that the participants go home with some preparation for 're-entry shock' and some ideas for the future. Follow-up sessions are continued through the efforts of regional office personnel.

Nutrition in Canada World Youth Education Programme

Canada World Youth's learning objectives for participants include personal growth learning skills, interpersonal skills, intercultural skills and education for development. The major learning in the development area concerns those issues related to food and agriculture, health and nutrition, water, education, ecology and environment, population and natural resources, trade, technology and disarmament. This year, for the first time nutrition has been formally included as part of the programme designed for personal growth and well-being, and is integrated into those sections devoted to food, agriculture, health, water and environment.

The subject matter contained in the resource manual consists of basic nutrition information such as building a well-balanced diet around the staple food used in the exchange country, a new idea for Canadians brought up on the four food groups of Canada's Food Guide: protein complementarity and food hygiene. Activities and exercises are included to help participants study the food and nutrition situation in their host community and to relate it to other aspects of development such as agriculture and health. This is the first year that Canada World Youth staff has had a formal programme manual with objectives clearly set forth, and a variety of methodologies outlined. It is still very much a preliminary document, and will not be complete before considerable use and evaluation. But we see it as an exciting start to a new and better way of helping our young people learn to look at nutrition, food and agriculture, as they relate to a country's development plans.

In previous follow-up studies of former participants, it had been noted that of those who went on for formal study, one-half were enrolled in development-related disciplines such as health, social sciences and social services. About 25 percent of those employed were in health or social services and 10 percent in anthropology, rural or international economics. More than 90 percent said that their views on development had markedly changed through the experience. The researcher noted that the programme seemed to encourage a more comprehensive and sympathetic understanding of underdevelopment. It will be interesting to see if our more formalized set of learning objectives and more extensive resource materials, along with a more scientific evaluation process, will result in increased learning and commitment to development concerns.

Not all of the twenty or so exchange countries which have participated in the programme carry out formalized systems of follow-up or evaluation. In the feedback from those which do carry it out, a very positive response has been made to the usefulness of the programme in meeting their objectives for participants and communities.

And the Future?

Canada embarked on its international aid programmes in 1950 with participants in the Colombo plan for assistance to former colonies which had become independent Asian nations. Since 1968, the Canadian International Development Agency has been responsible for this international development aid. Recently a number of priority directions have been identified. These include agriculture and food sufficiency assistance, energy aid, and human resource development with a philosophy of helping people help themselves. Projects and programmes that are local institution-building and self-help are most likely to be favoured over those which rely on more sophisticated imported technologies. The importance of open-minded team work that is mutually respecting and non-judgmental is becoming more and more appreciated, both in Canada and in the developing countries (McAllister 1983). Since Canada World Youth programmes appear to fit well into these directions, we are hopeful that some support from the Canadian International Development Agency will continue along with increased private funding.

For most Canadians the daily pressures of life in the Third World are far removed from reality. Most of us find it hard to comprehend the frustrations of the developing nations so well expressed by President Nyerere: "...if the rich nations go on getting richer and richer at the expense of the poor, the poor of the world must demand a change.....and we do demand change. As far as we are concerned, the only question at issue is whether the change comes by dialogue or by confrontation."

I have been involved with the Canada World Youth programme for just over a year, but I have come to believe that it is a programme that can significantly help in the process of dialogue between ourselves and the developing nations, which is vital to a peaceful reallocation of the world's precious resources, including food. Being involved, even in a small way, with an attempt to bring about the attitude changes needed to tackle the root causes of hunger and malnutrition has given me a renewed sense of hope and optimism for the future.

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5.6 Wage-earning Mothers - Opportunities for Nutrition Education

by

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Urban industrial growth is a feature common to many developing countries. In some instances governments such as that in Sri Lanka have adopted policies to stimulate industrial development by the establishment of Free Trade Zones. An important outcome of this in Sri Lanka has been a steady increase in the size of the female urban workforce. Women now undertake a range of activities in service occupations and the formal and informal sectors of industry and commerce. A major problem facing these women is their concentration in unskilled, low status and consequently low paying jobs (Jayasinghe 1981). Employment for the vast majority of women is a question of economic survival against a background of high unemployment and spiralling costs of essential commodities such as food and fuel. It is little wonder that in this situation many women feel compelled to work in order to supplement meagre family incomes. Urban industrial labour imposes new and often exacting demands on women, especially those with family responsibilities and young children to care for.

In cities, especially amongst newly arrived immigrant families traditional kinship ties and child feeding and rearing practices give way to new family life patterns in which distance between home and workplace, long and inflexible working hours and the inability to supervise young children during the working day are dominant factors (WHO 1976). The extended family may be replaced by the more mobile, but often less stable, nuclear family consisting of husband, wife and children. In some African, Latin American and Caribbean societies female-headed households are becoming the norm. However in other countries, for example a semi-urban area close to the capital city of Sri Lanka, the extended family continues to function as a lively social unit.

It is important that those concerned with community nutrition programmes and education should be aware of the changes going on in family structures and how individual family members are responding to the economic and social stresses of city life. Patterns of infant and family feeding are inevitably affected by these circumstances. Prolonged breast feeding becomes increasingly difficult for mothers in employment where no provision is made for breast feeding breaks, flexible routines, day care centres and other such measures which allow for the physical closeness of working mothers and their infants (WHO/UNICEF 1979). Faced with such constraints many mothers resort to artificial feeding, often with disastrous results. In urban slums or any situation where poverty and poor environmental conditions abound, safe and successful bottle feeding is virtually impossible. The rise in marasmus and diarrhoeal disease occurring in infants during the first year of life is a matter of considerable concern to nutritionists and health authorities of urban areas.

In some countries married women employed within the formal sector are assisted and protected by legislation regarding maternity leave, maternity benefits and job security during prescribed periods. In addition guidelines may also exist recommending that employers provide creche facilties and nursing breaks at the place of work. In practice these latter recommendations are hard to enforce. In cities where unemployment is high stringent legislation in favour of married women may actually jeopardise their chances of employment as employers can readily switch to recruiting from the pool of unemployed men and single women.

An interesting point to emerge from a UNICEF sponsored survey undertaken by the Women's Bureau in Colombo, Sri Lanka, was that in urban settings, even if creche facilities were forthcoming at the place of work their usefulness as a possible solution to the breastfeeding problem was negated by transport difficulties encountered by the mothers. In crowded cities where public transport is severely congested during peak rush hours it is unrealistic to expect a mother to transport herself and her baby to her place of work each day, especially if, as is often the case, the journey is one of considerable distance. In this study three hundred women from the public, private and estate sectors were interviewed. A comprehensive collection of data was made relating to the background of the working women, what supportive facilities and benefits were available to them at work and their ability to use these provisions to good effect and problems and difficulties they experienced in the realms of child care and feeding. As a result of their findings the Women's Bureau arrived at the conclusion that probably the most effective way of safeguarding and promoting breastfeeding would be to recommend to government that the present maternity leave in Sri Lanka of 42 days be extended to a period of six months (Women's Bureau of Sri Lanka 1982).

Surveys of this nature illustrate the important contribution which women's organizations can make to the improvement of the health and wellbeing of families. Nutrition education programmes need to be based on evaluated facts such as these and not merely on speculation and value judgments. The vigilance of women's organizations in monitoring the social and economic circumstances of women and their families, scrutinizing legislative provisions, high-lighting real life problems and recommending possible solutions adds considerably to their influence both at the community and national level. Their efforts and actions enhance the planning of effective ways of communicating nutrition knowledge.

Another important way of securing the wellbeing of mothers and their families is by the provision of relevant and effective Mother and Child Health services, which are both acceptable and accessible to the people they serve. The work of nurses and midwives is such that they come into close contact with families. They often gain the trust and confidence of women during their provision of ante-natal, delivery, post-natal and child care and thus are in the potential position of being key nutrition educators. Many are aware of the difficult circumstances of low income urban families and wage earning mothers but may be limited and constrained in their efforts to provide support. Their inability to help effectively is often the result of management problems such as being burdened with heavy caseloads. Employed mothers may find it difficult to take their children to clinics for growth monitoring, nutrition counselling and immunization unless these services are provided in hours outside the normal working day. Perhaps the factor which hinders the performance of health staff most when it comes to dealing with the particular problems of disadvantaged families is their lack of imaginative basic training and opportunities for continuing education. Health staff need to be kept well informed about the current problems facing mothers and children in towns, which in situations of poverty place them at high risk. They need to be alert to the special dietary and physical needs of women during pregnancy, especially those working long and exhausting hours for little remuneration.

Working mothers, particularly those with their first baby who have lost the traditional support systems once provided by the extended family often welcome informed advice on matters concerning infant and young child feeding. Problems to be dealt with might include things like 'how to prevent their breasts from drying up, how to cope with tiredness and how to combine their housework duties and breast feeding in their hours away from work'. In cases where the mother feels she has little option but to resort to artificial feeding, which is hazardous and expensive, advice should be given on the correct and hygienic preparation of feeds. For the older infant sound advice on when to start giving food in addition to milk and suitable weaning mixes is important. These should include appropriate high energy dense mixtures consisting of locally available food stuffs (i.e. staple/bean, pulse or animal protein supplement/vegetable supplement/oil).

Finally, it should not be forgotten that close relatives and child guardians undertake a significant share of child care and feeding responsibilities in families where mothers are employed. Where possible health staff should get to know them and support and counsel them in this important task. In these ways health workers and women's organizations can develop and implement supportive and protective strategies to assist working women in their dual responsibilities of wage earner and mother.

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5.7 Workshop Discussion

The number and the diversity of papers in this chapter are an indication of both the interest and importance attached to this area of nutrition education. Many issues were raised during the workshops devoted to non-formal education and the number of questions which still remain to be answered is formidable.

Current emphasis on nutrition education is often a part of government food and nutrition policy, coordinated by a multi-ministerial group such as a Food and Nutrition Council. The implementation of policy is usually by civil servants. It is not easy for them to raise uncomfortable issues such as poverty and poor distribution which are the fundamental causes of malnutrition; it is often easier to support the status quo than to risk losing a job.

Consideration was given to textbooks and manuals. The difference between these needs to be defined and also the target audience. It is essential that the nutrition content of the books is constant and reliable whilst allowing for relevancy and specificity in various situations and countries. Prototype materials such as those produced by WHO and FAO are valuable. Yet even translation, artwork and printing may be too expensive for some countries. It was recognised that even the best training manuals cannot really bridge the gap between village conditions and the training situation. The means by which this should be done requires careful consideration.

Meal choosing systems were discussed in one of the workshops. Irene Finch gave a paper in which she pointed out that it was necessary first to decide if a simplified meal choosing system was really necessary. If the answer was yes then it would be desirable for all those involved in nutrition education, including doctors, nutritionists, teachers and members of the general public, to have a common basis for discussion. A meal choosing system had much to recommend it in a mixed society like that of the United Kingdom in which many groups have lost, or have had to modify, traditional eating patterns. Each country would, of course, require a system to meet its particular needs. Any meal choosing system must be simple enough to be used easily and effectively. It should also provide information which would form a basis for further education. Advice given at an early stage should not need to be contradicted by more specialist nutrition teaching. It should also be sufficiently flexible to accommodate new ideas about particular nutrients.

We also need to determine how we distinguish between education to enable proper food choices to be made and interference with personal freedom of choice. Who decides what we should eat? Are there inherent dangers? Who develops the guidelines and on what are they based? There is a delicate balance between 'guidelines' and programming people. Are there interest or pressure groups involved? When changes in research indicate changed guidelines does it further consumer confusion?

There is a similar moral problem with immigrant or ethnic minorities. Should assimilation be encouraged, including the adoption of local habits, even if they are undesirable, or should the retention of cultural identity and food habits be encouraged and allowed even if these are perceived as expensive, non-practical or harmful in the context of the new country because of climate or other factors. As Jane Thomas pointed out in a paper which looked at nutrition education in minority groups, there is a delicate balance between the desire of nutrition educators to bring about change in an area tightly bound up with an individual's cultural identity and our responsibility as a 'caring society'.

Other issues raised included the problems of vulnerable groups including the elderly and how best to provide nutrition education for such individuals within the community. The role of industry in nutrition education was explored. The level of distrust of business differs in different countries. Business has money and expertise; questions were asked about their vested interests and ability to act with corporate social responsibility.

If these questions are being posed, which need to be dealt with now and in the immediate future, the final question must be how do we train nutrition educators to cope? A radically new type of training is required to enable all those engaged in nutrition education to meet the demands of the final decade of the twentieth century.

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CHAPTER 6

EVALUATION

Evaluating Nutrition Education Projects

by

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"Reading about nutrition education, one is amazed at the large amounts of dedication, creativity and resources which have been invested in programmes and at how little we know about the effects they have produced", wrote Dr Schürch (Schürch 1982). It was therefore particularly appropriate that the conference was able to devote a session to problems of evaluation - at which Dr Schürch was present. The presentation of papers was followed by a wide-ranging discussion session led by Dr Johanna Edema who has considerable experience of working on the sociological aspects of nutrition education projects.

The papers were very different in the scale of the projects described, in the type of education evaluated and in the evaluation techniques used. Perhaps the common theme running through them was pragmatism, the need to develop suitable methods of evaluation in circumstances which were less than ideal and the need to use the results of the evaluation as a basis for achieving improvements in the nutrition education provided.

Alexandra Praun reported on a study carried out by the Institute of Nutrition of Central America and Panama in 1982. This involved an evaluation of the nutrition education provided by twenty-six institutes in the region with a view to identifying the technical assistance needed in order to make improvements in the nutrition education given. Up-to-date information was required quickly as a basis for action. The study therefore confined its evaluation to six topics, including the planning of nutrition education, and the educational methods used. The results were analysed taking into account the commitment and priority which each institute gave to nutrition education. Attention was concentrated on those aspects of nutrition education which most needed and were most likely to respond to short-term assistance. It was felt that immediate improvements could be made in research into educational methods, in training and monitoring the performance of staff engaged in nutrition education, in the production of teaching materials and in the development of methods for evaluating nutrition education programmes.

Jean Weaver's paper deals with nutrition in Malawi and reports on the first results of a national survey to evaluate the effectiveness of nutrition education. Although Malawi is self-sufficient in food, infant mortality is high and the existence of various forms of malnutrition suggested the need for education to ensure adequate nutrition for all the family. Nutrition is included in the curricula of primary and secondary schools, government sponsored and supervised health programmes, extension programmes to women and in newspapers and on the radio. The survey examined the content of the nutrition education provided, the means by which women received nutrition education, mothers' nutritional knowledge and the ways in which they fed their families. A majority of women had received no formal schooling and most did not listen to the radio, but well over three-quarters attended Mother and Child Health Clinics. In general mothers had a fuller understanding of the nutritional needs of their infants and fed them better than was the case for other family members, including themselves.

Kathy Cowbrough discusses the evaluation of one particular type of event, the Nutrition Weeks held in the state of Nova Scotia in Canada. These are designed to interest people of all ages in the importance of healthy eating. Since these high-profile campaigns involved considerable expenditure over a short period of time, evaluation was clearly required from the outset. Initially evaluation focused on participation rates and objectives were set in terms of the proportion of the various target groups taking part in the nutrition activities provided. In 1982 the evaluation concentrated on schoolchildren between eleven and fourteen years. This age group was regarded as particularly difficult to reach and unreceptive to nutritional concepts. Although four-fifths could recognise the Week's nutritional slogan, less than half understood its meaning. Thus the week served to highlight a nutritional theme but, at least with these children, it had limited success in achieving its aim of conveying a message which could be understood by everyone.

Jane Thomas also deals with children's response to nutrition education. Her study concerned two secondary schools in England where a short nutrition pilot project was designed as an addition to the existing curriculum to be taught by non-specialist teachers. The aim of the project was to increase the dietary awareness of the children by means of a choice of group activities. The evaluation carried out at the end aimed to test the children's nutritional knowledge, to find out if children's eating behaviour had changed since the project began, to investigate children's response to the project and their attitude to nutrition education, to seek teachers' opinions about the project and to come to conclusions about the suitability of non-nutritionists teaching dietary awareness and, finally, to adapt the project to make it easier to teach and more effective. In general children's eating behaviour appeared to have changed little as a result of the project. It became clear that the design of successful nutrition education needed to take into account such factors as teachers' attitudes, the facilities provided by school canteens as well as practicalities such as the nature of the timetable and the time of year.

Michel Andrien was a member of a Belgium team which in 1980 was asked to evaluate a nutrition education programme run for mothers by a hospital in the Ivory Coast. The team began by clarifying the objectives of the programme with the pediatrician and the main participants. Criteria were set up for assessing the achievement of these objectives. It was intended that the evaluation would be both formative and summative, in other words that it would provide recommendations which could be put into effect part way through the evaluation process and that, at the end, it would also arrive at conclusions. Attention was given to the causes of malnutrition in the area and to the cultural context in which malnutrition occurred, so as to judge whether the nutrition education given was relevent to the mothers' socio-economic circumstances.

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Contributors

6.1 Alexandra Praun	A proposed methodology for the assessment of Food and Nutrition Education Programmes
6.2 F. Jean Weaver	Nutrition education in Malawi
6.3 Kathy Cowbrough	Nutrition education promotion - what impact?
6.4 Jane Thomas and Rita Kirkwood	Increasing awareness of choice: a pilot project for secondary schools
6.5 Michel Andrien	Evaluation of a nutrition education programme in Ivory Coast
6.6 Anne Coles	Report on Workshop discussion

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6.1 A Proposed Methodology for the Assessment of Food and Nutrition Education (FNE) Programmes

by

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In October 1981 the Institute of Nutrition of Central America and Panama (INCAP) set up a Food and Nutrition Education Unit. This Unit is run by a health educator and myself, a nutritionist. The objectives of the Unit are:

- To cooperate with the Governments of Member Countries of Central America and Panama in the development of food and nutrition education (FNE) programmes.

- To cooperate in the preparation of human resources and in the training of in-service personnel who have educational responsibilities in the food and nutrition programmes.
- To carry out and promote research on dietary behaviour, nutrition education and teaching methodologies.

In order to formulate the Unit's working plan it was necessary to obtain accurate information about food and nutrition education programmes in Central America and Panama. This enabled us to identify the factors which affect food and nutrition education in both positive and negative ways, and to decide on the immediate, short-term and medium-term actions necessary for the most effective development of these programmes.

Methodology for the Assessment of Food and Nutrition Education Programmes

INCAP has carried out an operational diagnosis at institutional level (Gallardo and Praun 1982), in order to assess the food and nutrition education programmes in Central America and Panama. This method was based on the 'Operational Diagnosis' described by Aguilar and Block, (1979), which is based on 'a general revision of the principal aspects of an operational situation, organisation or entity to establish the main deficiencies'. So it is a study of organisations, and within these we wanted to define and focus on deficiencies. What we did was to adapt their method of diagnosis to food and nutrition education programmes.

A. Description of the Methodology

The 'Operational diagnosis' has enabled us to obtain information related to six main areas of the education programmes:-

1. The policies, methodologies and resources taken into account for the formulation of FNE activities. (Planning Area).
2. The knowledge the institution has about the FNE target groups (Target Group Area).
3. The characteristics of the personnel responsible for the development of FNE activities. (Educator Area). We are interested in such things as who the educators are, and what type of training they receive.
4. The type of educational methods, techniques and teaching materials used in FNE. (FNE Technology Area).
5. The procedures used for assessing FNE programmes (Process Evaluation Area). What type of evaluation, if any, is taking place? What is done with the results?
6. The knowledge the institution has about the impact FNE activities make on each target group (Impact Evaluation Area).

For describing each one of these areas, a series of factors to be studied were identified. These factors were designed for looking at non-formal education. This is because, in Central America, most of the programmes related to nutrition education activities are in the non-formal sector. Nevertheless, a similar methodology could be used in the formal sector. We did not want to go deeply into the assessment; we needed information quickly on which decisions could be made one week later. Therefore, the factors considered are quite general. The methodology is designed so that in a short period of time it is possible to obtain reliable information necessary for making decisions concerning the operational development of such programmes.

B. Procedure for the Assessment

The assessment of the areas and factors of each FNE programme has been carried out by the personnel of the Institute directly responsible for the development of such programmes, preferably people who are working at different levels - at national level, regional and local levels. But, in reality, it has been difficult to get the three levels together round a table to discuss the facts. As it happened, we were able to develop this assessment mainly with people at the higher levels, national or regional. But now the same methodology is being adapted for use at local level. Most of the items are being subdivided in a much more detailed way, so that they can be used to evaluate and assess what is happening at individual centres. The procedure for this assessment is explained through the following four stages:

1. Identification of Food and Nutrition Projects A brief description of the food and nutrition project through which the food and nutrition activities were developed.

2. Study of the FNE Programmes at Institutional Level At this stage, the factors of each educational area are assessed using a specific form (Table 1).

Table 1: Example of the form used to study FNE programmes at Institutions

FACTORS ASSESSED	CATEGORIES				OBSERVATIONS
	A	B	C	D	
Educator Area	in detail	in general	partially	non existent	
FNE specified as a function of the in-service personnel	( )	( )	( )	( )	
Definition of requirements for FNE educators	( )	( )	( )	( )	
	enough	insufficient	very few	none	
Existence of personnel dedicated exclusively to FNE	( )	( )	( )	( )	
	Precise and adequate	in general	partially	none	
Existence of procedures for evaluating FNE educators	( )	( )	( )	( )	
Training in-service personnel in FNE	( )	( )	( )	( )	
Training personnel dedicated to FNE	( )	( )	( )	( )	
	appropriate	in most costs	partially	none	
Existence of incentives for personnel involved in FNE	( )	( )	( )	( )	

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Four categories are used: A, B, C and D. Category A refers to an optimum or excellent situation, category D to a deficient or non-existent situation, categories B and C refer to intermediate situations. In the column entitled Observations, additional comments are made, including anything related to why this item was assessed in the way it was assessed. These observations helped us make a descriptive analysis of the situation. Each of these items is discussed in the group, and it was interesting to learn that for many institutions this was the first time that there had been the opportunity to discuss these problems. Once we have studied each of these items (43 in total), and defined in which category to put it, then it will be assessed - the results are quantified.

3. Assessment of the FNE Programmes The maximum mark for the total programme is 1500 points. These points are divided among the six areas studied, in accordance to the weight each area has within a FNE programme (maximum points).

Areas	Maximum Points	Percentage
Planning	330	22.0
Target Group	200	13.3
Educator	200	13.3
FNE Technology	200	13.3
Process Evaluation	250	16.7
Impact Evaluation	320	21.3
Total Programme	1500	100.0

Within each area the maximum points are divided among the factors in accordance to their importance. This means that if a problem receives its maximum number of points, it is very serious. The assessment (given points) for each factor and area depends on the category each one obtained during the study:

Category D	100% of the maximum points
Category C	75% of the maximum points
Category B	25% of the maximum points
Category A	0% of the maximum points

The assessment of each factor, area and total programme is expressed through the Improvement Capacity Index (ICI %) which defines the degree in which any of the aspects can be improved until obtaining an optimum situation. The ICI % is obtained through the relation:

$$\frac{\text{Given Points}}{\text{Maximum Points}} \times 100$$

Based on this Index, which told us how much work had to be put into an item to improve it, two types of decisions could be made. One of these related to priorities, in other words which items, factors or areas ought to receive short-term or long-term action.

Priority of Action	ICI %
Medium term	0 - 24
Short term	25 - 49
Immediate action	50 - 100

The weighting method used in this assessment responds to a higher scoring for a higher level of deficiency. The purpose is to magnify and facilitate the identification of the deficiencies. The second way in which the data can be used is related to the importance attached in each case by the institutions to those areas, FNE programmes or activities. This helped to show how successful the programme was and was done by translating this Index into profiles.

4. Graphical Presentation of the FNE Programmes The results of this assessment can be graphed to obtain a profile which reflects the importance or attention given by the institution to each factor and area of the FNE programme. This is compared to an ideal profile. These profiles facilitate the presentation of the results and conclusions of the assessment to the institutions which participated in the study. This was done as a feedback of information to the institution.

C. Interpretation of the Results

Through the identification of food and nutrition projects developing FNE activities and the study of the FNE areas and factors, it has been possible to obtain a qualitative description of the FNE process launched by the institution. This description becomes more objective through an analysis of the assessments obtained, inter-relating the factors and areas studied.

The recommendations to be given are based on the priorities that have been identified through the assessment. The principal recommendations should relate to the aspects which require immediate action. Combining the analysis of the different factors made our conclusions more valuable. The profiles are a graphical expression of the FNE situations within the institution. These graphs can be used to synthesize the total assessment through precise and objective presentations. They can be used to make comparisons between an ideal situation and different periods of time to detect changes. This assessment should provide objective data, therefore the interpretation has to be equally objective. The conclusions have to be relevant and realistic and the recommendations feasible, otherwise it is not worthwhile doing all this work. We believe that this methodology gives a good impression of what is going on. If we wanted to have well-defined actions on activities, we would have to make a different type of assessment.

In conclusion, as a result of this methodology which we have implemented in 26 governmental institutions in Central America and Panama, we were able to define four main problem areas and we have started to implement the food and nutrition education unit programme.

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6.2 Nutrition Education in Malawi

by

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Malawi is a small landlocked country of some 104,000 square kilometres in Central Africa, bordered by Tanzania, Zambia and Mozambique. With only two large towns, Lilongwe and Blantyre, over 90 per cent of the population live in rural areas. Both population density and the population growth rates (2.9%) are high. Assuming that the growth rate remains unchanged, it is estimated that by the year 2000, Malawi will have a population of 10.7 million (Ng'ong'ola 1983). Forty-five per cent of the population is under fifteen and twenty per cent is under five. Only about a fifth of the adult population is literate, having completed five years of primary education (Malawi Government 1977).

Agriculture is the mainstay of the economy. Although there is some industrial development, Malawi lacks exploitable mineral resources. Of the land considered suitable for agriculture, over 86 per cent was estimated to be already under cultivation in 1977. The land is fertile and the water supply is good, but climate and agricultural practice support only one crop a year without irrigation. Maize is the staple diet for most of the population. Malawi is self-supporting in agriculture and, has in fact, been a source of emergency food supply for neighbouring countries suffering short harvests in recent droughts.

Nutritional Status

In spite of its agricultural productivity, Malawi is faced with serious nutritional problems. The mortality rate of children under five years of age was estimated in 1979 by the Ministry of Health at 377 per 1000 live births. Of these approximately half occurred within the first year (MOH 1979). Until recently, Ministry of Health statistics from hospital and clinic records have provided the only data for evaluating national trends in nutritional status. However the Ministry of Agriculture and Natural Resources (MANR) has incorporated food and nutrition components in the Annual Survey of Agriculture (ASA). In the future, the ASA will provide national and sub-divisional statistics on nutritional status and food utilization, and correlatives with agricultural production and farm resources. To establish benchmark statistics for the ASA, the National Sample Survey of Agriculture (NSSA) was carried out in 1981 and 1982 (MANR 1983). Those data are not yet available. But we do have revealing results from the pilot NSSA which was undertaken in four representative areas on individual members of 112 households during eight months in 1979, and analysed in three Rounds at preharvest, harvest and postharvest. Food and nutrient intake was evaluated by weighed food consumption. Nutritional status of children under five years of age was evaluated by recording height, weight and age (MANR 1981).

Children show high incidences of undernutrition. About one-third of the under-fives are underweight for their age (below 80% of the reference median). Low weight-for-age is found in children who have experienced long-term chronic undernutrition as well as in children who have had a recent, severe, acute dietary insufficiency. A good indication of chronic nutrition problems is the measurement of length-for-age. Over the whole country, with variation among districts, the incidence of stunting is high; 25 per cent to 35 per cent of the age group had heights below 90 per cent of the reference median (preharvest 25%. harvest 32%, postharvest 35%). Weight-for-height is used as a measure of a child's current nutritional status. Measles, malaria, and diarrhoea can produce nutritional wasting, particularly in a child whose diet may not have previously been optimal. The numbers of wasted children (those whose weights are less then 90% of the reference median) is relatively low; only 3 per cent and 2 per cent in Rounds 1 and 2, and none at all in the postharvest Round. This data suggests that malnutrition is a chronic, long-term problem.

Recorded energy intake for all age groups averages 69 per cent of estimated requirements. Maize provides about 74 per cent of energy intakes. Fat provides only 10 per cent with groundnuts being the most important source of fat. Animal foods provide about 6 per cent of dietary energy and 15 per cent of dietary protein. On average protein provides about 12 per cent of the total energy intake and therefore when energy requirements are met the quality of the diet is satisfactory with respect to protein. Intakes of vitamin A and riboflavin are low throughout the year. Intakes of iron are not low but it is believed that a large proportion of the population have infestations of parasites such as hookworm, bilharzia and malaria which increases the requirement for iron.

There are only slight differences in meal frequencies by season, ranging from an average of 1.5 to 1.7 meals per day. Meal frequency is slightly higher in the preharvest period, which implies that food availability may not be the primary factor affecting meal frequency. Other factors may be important such as labour demand for activities other than meal preparation. For children under five years of age energy intakes average about 57 per cent of estimated requirements. In general, meal frequency for the children is the same as for the rest of the family: 1.5 meals a day. Pregnant women's intakes of energy, protein, iron and vitamin A are generally low, particularly during preharvest and harvest times. For lactating women, nutrient intakes are also low, but not as markedly as these two other at-risk population groups.

Nutrition Education Programmes and Activities

In 1973 a nutrition planning team from the Freedom From Hunger Campaign was invited by the Malawi Government to develop a national food and nutrition programme (Thompson, Cameron and Jackson 1974). Their main recommendation was that the Ministry of Agriculture and Natural Resources (MANR) should be the Ministry responsible for national food and nutrition programming, and as a result the Food and Nutrition (FNP) unit was established in the Ministry. Nutrition education in the agriculture extension service is among the responsibilities of the Food and Nutrition Unit (FNP). For that purpose the FAO 'Food and Nutrition Field Programme management' model training package has been modified to suit the Malawi situation and is now being introduced to field trainers. This should enable food and nutrition programmes in the villages to be better informed, more comprehensive and more accountable (MANR 1982). The Food and Nutrition Unit also has some influence on the coordination of food and nutrition programmes through the Interministerial Committee on Nutrition. The Committee comprises representatives of the Ministries of Agriculture, Community Services, Education, Health and the College of Agriculture. Each of these government units as well as some private organisations, are involved in nutrition education in one way or another.

It appears that the content of nutrition education programmes, whatever their sponsorship, is fairly consistent. The concept of a balanced diet is conveyed through 'three food groups' which should be included in daily meals for all age groups: body-building protein foods, fruits and vegetables and energy yielding carbohydrates and fats. It is recommended that breast feeding should be continued up to two years or more, with gradual weaning. Supplementary feeding with enriched porridge should begin about the fifth or sixth month. Bottle feeding is dangerous for hygienic reasons, and the better practice is to feed an infant by use of a cup and spoon reserved for that purpose and carefully washed and stored. Pregnant and lactating mothers need extra amounts of body building and protective foods. Hygienic household practices are important to protect the health of the family, and especially the young children. Antenatal and Underfive Clinic services should be utilized. (MANR 1975, MOH 1978, Gonthi 1979).

In primary schools home economics is taught only to girls, but nutrition is included in agriculture and health lessons which reach both boys and girls. The secondary school curriculum in biology includes units in digestion, nutrients and human nutrition (Gonthi 1979, MCE 1980). Few teaching materials and texts are provided for students so the quality of instruction depends on the sophistication and skill of the teacher. At the Agriculture College courses in human nutrition are required for all students, men and women, although only women study food processing and feeding the family (University of Malawi 1982).

Evaluating Nutrition Education Efforts

A conference for senior home economists from government and non-government agencies in July 1982 identified the inadequacy of the Malawian diet as a foremost concern. 'Adequate food the year around' was put forth as the primary need of individuals and families (Bunda College 1983). Although Malawi's record for agriculture productivity is exceptional for this part of Africa, the food available for family utilization is insufficient, preservation and storage techniques are underdeveloped, and knowledge of sound nutritional practices is lacking. The conceptualization of three basic food groups required in the daily diet may be too simplistic to overcome and prevent nutritional disease. But it can be argued that nutritional education has to be communicated in a simple way to illiterate and unsophisticated audiences.

The new Food and Nutrition Field Extension Management Course Book (MANR 1983) which has been adapted for Malawi from the FAO model package deals with nutrients as protection against the known Malawian deficiences and considers malnutrition as the result of blocks in the local food supply system. The field workers course emphasises working with the community to provide the necessary conditions for improved nutrition.

Recently the Centre for Social Research undertook a national survey to evaluate the effectiveness of nutrition education efforts in rural areas (CSR 1982). Malawi sub-divisions have been classified on Ministry of Health records according to general nutritional status of the population and by Agriculture according to level of agricultural development. The sample, over 600 households representing all three regions of Malawi, were stratified on these two dimensions. It will be possible in the analysis to consider community variables (agricultural development and nutritional status of the population) and individual variables including literacy, participation in nutrition education activities, comprehension of the three food groups, family feeding practices and others.* A preliminary analysis of the responses to the mothers' interviews is presented here.

The Under-five Clinics are the most used opportunity for nutrition education by village women. Only one in six women attend classes, and only a quarter listen to the radio, although there are six popular Chichewa programmes with relevant content. Of those who go to classes, most have been to Under-five Clinics, and some attend meetings offered by Homecraft Workers from the Ministry of Community Services, and a few go to various classes organized by the agriculture extension service or by the church.

When they named the subjects they have learned,

77% said cooking
68% said child care
20% said home management (this includes hygiene)

These subjects form the content of the Under-five Clinic syllabus which emphasises health care and feeding practice (MOH 1978). Less than 5 per cent have had classes in farming.

Half of the women do not understand the concept of three food groups and about 40 per cent do not provide nutritionally adequate meals for their families. When they were asked to explain the three food groups their answers were graded '0' to '5', and the mean score is 1.6. Only one third scored '3' or above; about 6 per cent of the answers received full marks. When asked to name the food groups and give examples of each, half answered incorrectly. Although 40 per cent know the names of the three groups, less than 20 per cent were able to name two foods in each group. When questioned about foods that children and pregnant women should eat to ensure good health, their responses were more encouraging: 60 per cent named foods from each food group, although 15 per cent named foods from only one of the three groups.

Meal frequency is not so low as in the pilot National Sample Survey of Agriculture of 1979. Adults and children five years and older eat 2.6 meals a day on average; children under age five are fed 2.7 times a day. Infant feeding practices are reasonably good on the whole. Almost all mothers breast feed. Only 12 per cent feed infants from a bottle. Most of those who bottle feed clean the bottle properly but some are unable to explain why these practices are necessary. Infants receive their first solid food at about four months, although a small number do not receive porridge until they are seven or eight months old. Enrichments to the porridge include sugar and salt (in 41% of the families), groundnut flour (27%), milk or milk powder (16%) and egg (15%). Fat or oil are rarely added. It appears that in about 10 per cent of the families nothing is added to the maize porridge. Children are weaned on the average between 22 and 24 months, although about 8 per cent are weaned before their first birthday and 15 per cent are still nursing at age two. Two main reasons are given for weaning: either the mother is pregnant (25% gave this reason), or because mother or child prefers to give up breastfeeding (33%).

Mothers' literacy was enquired into and was found to be low although better than in the 1977 Population Census. About half have had no schooling at all. Although there have been some basic literacy programmes in the villages in the past, less than one per cent have learned to read outside the primary school.

Malawi's nutritional problems are much like those in other developing countries (Berg 1973, Gopalan 1980). The infant mortality rate is high and there is clinical evidence of protein energy and protein malnutrition in childhood, as well as anaemia, vitamin A deficiency, and in some areas goitre. The average energy intake among all ages is low, varying seasonally from 60 per cent to 70 per cent of estimated requirements. Levels of formal education and literacy are low, particularly among women. There is a difference in Malawi, however, in that the agriculture is sufficiently productive to provide enough nourishment for everyone with a surplus for export. The challenge for Malawi is to educate and motivate people to manage a good food supply in order to overcome serious nutritional deficiency diseases and to provide a healthy diet for the whole population.

*Report of the study "Programme Evaluation: Nutrition Education" is to be available from the Center for Social Research; L. Msukwa, Director, Box 278, University of Malawi, Zomba, Malawi.

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6.3 Nutrition Education Promotion - What Impact?

by

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The ultimate aim of Nutrition Educators, working in communities anywhere in the world, is that their message will eventually lead to a change in eating habits when needed, so that individuals can enjoy a healthy life. New, innovative and effective techniques are constantly needed to try and get messages across. Even though a message may be heard, there are many obstacles to overcome before the message is understood and, most important, acted on.

In Canada there are many people involved in Nutrition Education either directly or indirectly in various government departments. The Department of Health at national and provincial level are responsible for establishing Nutrition Recommendations and Guidelines and they pool ideas and resources for implementing the Recommendations.

Nutrition Week in Nova Scotia, Canada

One technique for promoting nutrition principles that was initiated in Nova Scotia in 1979 was to hold a Nutrition Week. The purpose of the Week was to provide an opportunity for nutrition and information principles to be highlighted. The long range goal is outlined in the first paragraph.

A Nutrition Week has been held each year since then and in 1982 it became a national event, expanding into a Nutrition Month where local provinces may choose to focus on one week. A theme is selected in co-operation with national and provincial representatives. Who is to be targeted and how best to promote the message can be decided at a more local level. But there are various support materials such as pamphlets, brochures, posters, stickers and buttons developed at a national level, as well as possible national media support depending on finances available. On a more local level nutritionists, dietitians, home economists, teachers, dental hygienists, nurses etc. may develop ideas and produce materials to involve specific target groups. Examples of some activities used in promotion of Nutrition Week in Nova Scotia and possible targets appear in Table 1.

Table 1

Nutrition Week Activities	Target
Name the Logo Contest	Schools (Primary)
Poster Competitions	Schools (Primary)
Puppet Shows	Preschools and Primary Schools
Skits, plays by elderly	Schools
Small plays, skits put on by schools	Community
Closing soft drink machines and selling nutritious snacks	Schools, office canteens
Weight Loss Competitions	Offices, hospitals
Nutrition and Fitness Breaks	Offices, hospitals, homes
Dance and Lunch Contests	Schools
Placemats for Restaurants	Community
Dress Up as Foods	Schools (Primary)
Food for the day	Caterers in offices, hospitals, schools
Marketing a Local Food	Schools, home, media
Puzzles, Quizzes	Schools
Radio Phone-Ins, Interviews	Community

Evaluation of Nutrition Week in Nova Scotia

In Nova Scotia, the need for evaluation of the first Nutrition Week project became very evident as it forced nutritionists planning the programme to clarify aims and objectives from the beginning. A substantial sum of money would be spent on the project and there needed to be an indication of who was actually reached during the Nutrition Week. Thus this initial evaluation focused on determining participation rate in Nutrition Week activities and collected other information on usefulness of materials and reactions to the week. Response to the Nutrition Week in terms of participation rate was higher in all school groups targeted than nutritionists had anticipated in their objectives. Table 2 gives a brief summary of results from those who responded to the questionnaire.

Table 2 Nova Scotia Nutrition Week 1979. Summary of Possible Participants in Nutrition Week, respondents to survey and actual participants.

Target	Possible Participants (ie no-targeted)	Respondents to Survey	Respondents as % of Possible Participants	No. of Participants in Nutrition Week as indicated in Survey.	Participants in Week as % of Respondents to Survey
Pre-School Centre	276	122	56%	107	88%
Primary School Teachers (Grades Primary - 6)	5087	2302	45%	2002	87%
Student Councils in Secondary Schools (Grades 7 - 12)	121	50	41%	32	64%
Home Economics, Health and Physical Education Teachers at Secondary Schools	1026	398	39%	301	76%

Note: Direct Comparison should not be made between all targets since some are centres or groups while others are individual teachers.

Because of the lower participation rate of Secondary School pupils in 1979 Nutrition Week and the difficulty of reaching and interesting the 11-14 year old age group in nutrition, an evaluation of the impact of Nutrition Week in the Junior High School System was carried out. It focused on measuring theme awareness or recognition and theme comprehension by Junior High Students (11-14 year olds). Additional information was gathered on the implementation of Nutrition Week in the schools.

Among Junior High Students, theme recognition was found to be high with 84 per cent of the students able to correctly identify the 1982 theme 'Grab

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A Bite That's Right'. However. theme comprehension was considerably lower with only 44 per cent of the students able to choose the correct meaning. There was a weak indication that the type of planning group in the school was a determinant of theme recognition but had no effect on theme comprehension. If one considers the level of recognition as the only criteria of success, then Nutrition Week is highly successful. However the possibility exists that the same level of recognition may be achieved with just the distribution of adequate supplies of buttons, stickers and posters bearing the Nutrition Week theme without any additional input from the school or the local nutritionist.

Finally, I would like to summarise some of the information collected on difficulties with and suggestions for implementation of Nutrition Week in schools. They are listed in no particular order of priority.

- Preschool centres for children aged 3-5 seem particularly receptive to Nutrition Week Kits which contain suggestions for nutrition related activities, and in some cases activities ready for use, as well as nutrition information leaflets.
- Primary School pupils aged 5 - 11 seem keen on participating in contests, e.g. name the logo, or in competitions, e.g. posters, theme ideas, plays, dramas.
- Kits for Nutrition Week aimed at Primary School teachers had a low rate of use during Nutrition Week, but may be kept as a resource for future Nutrition lessons.
- Fun Nutrition activities suggested for Junior High School students tend not to be used by schools; instead they have been offering their own activities mainly in the form of offering nutritious foods and snacks. This could mean activities suggested are off target, there is lack of staff interest, or support materials arrive late.
- Suggested and offered activities often do not reinforce the theme but instead they tend to reinforce the Week as a whole, i.e. general nutrition principles.
- Some pre-testing of the theme with various age groups could be valuable in choosing a theme where the message might be clearer.
- Some students at Junior High School level seemed interested in creating their own Nutrition Week theme - a resource which might well be tapped.
- A change in the time of the year when Nutrition Week is held and the delivery of Nutrition Week materials well in advance of the Week may improve staff involvement at schools. These changes, coupled with the nutritionists working with the school Administration to obtain a commitment to the Week, should increase the level of staff interest and participation; which in turn will increase the potential impact of Nutrition Week on the students.

Nutrition Week has never been used as a tool where behaviour change is expected to take place; but emphasis has been more on understanding a message. It is clear that some of the suggestions above need to be seriously considered for participation rate to increase and to improve the impact of the message.

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6.4 Increasing awareness of choice: a pilot project for secondary schools

by

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It is now many years since Lawrence Green (1975) summarised so well the dilemmas for evaluation in health education yet most of them are still with us. Our methodologies have become more sophisticated in some instances, but we are still beset with a central dilemma. Nutrition education takes as its starting point the harnessing of people's own enthusiasm and often incorporates elements of spontaneity and serendipity that elude the carefully pre-planned evaluation and may consequently fail to show themselves in statistically significant terms at the end of the day. Thus we have the classic dilemma of the rigorously planned evaluation of a programme which is so tightly controlled as to be sterile, or the scientifically inadequate evaluation of a programme which a 'gut feeling' and observation indicates to be exciting and positive but a lack of evaluation detail makes unconvincing to funding bodies or difficult to reproduce. Of course there are many intermediate situations.

The study described briefly in this paper is probably somewhere between the two extremes. No great claims can be made for the rigour of the evaluation procedure. Nor can a great breakthrough be claimed in terms of exciting results. However the exercise did help to clarify some ideas on ways of improving children's awareness of food choice and the practical problems which may arise with such a scheme.

Background to the Project

In recent years there have been major changes in the school meals service in England and Wales. Since 1980 Local Authorities no longer have a duty to provide a school meal of recommended nutritional intake (880 kcal and 29g of protein on average) and school canteens have been rapidly changing to a cafeteria style of service. It seems that cost considerations have been more important in a lot of recent thinking than nutritional ones.

However in one school (a mixed comprehensive school of about 600 pupils between 11 and 16 years) in Cambridgeshire members of the Parent Teacher Association (PTA) and staff were concerned about the implications of these changes. They were concerned with the nutritional content of the meals and their popularity - the numbers of pupils having school meals had fallen from nearly 600 to around 300. Local resources were mobilised to look at the problem in more detail and a survey was carried out to investigate lunchtime eating habits. The survey examined:-

- The nutritional content of packed and cafeteria lunches in relation to price
- The nutritional content in relation to recommended intakes

- The attitudes and preferences of children for different types of meal.

Representative meals were also analysed by the Dunn Nutrition Unit in Cambridge; their findings included:

- Intake of fat was high - 65 per cent of children were taking more than 40 per cent of their energy as fat.
- Packed lunches were generally lower in dietary fibre and energy than cafeteria meals.
- Older children, especially girls, ate inadequate amounts.
- Those eating lunch outside school had inadequate intakes of Vitamins A and C, riboflavin, iron, zinc, dietary fibre and energy.
- Almost 50 per cent of packed lunches were either prepared by children or consisted of food chosen by the children.

The report of this survey also made recommendations concerning improvements in the meals at the school, including suggestions for a well-balanced slimmers meal to encourage older girls to eat at school. However by the spring of 1982 there was little sign of any of these changes being implemented. By this time the local health authority had produced recommendations for a nutrition policy which included the following:

- Fat should provide no more than 30 per cent of energy
- Carbohydate - the intake of sucrose should be reduced and the amount of unrefined carbohydrate should be increased
- Salt intake should be reduced to a maximum of 12g per day
- The intake of dietary fibre should be increased to about 30g per day

At this point one of the parent governors of the school approached the Department of Nutrition at Queen Elizabeth College for help with ideas for a programme to improve pupils' awareness of their own food choice and its implications and also to increase their awareness of the variety of foodstuffs available to them. A small pilot scheme was designed to meet these needs. Constraints included:-

- the course should be available to all students not just those studying biology or home economics and suitable for pupils of all abilities.
- form teachers should work on the project (irrespective of their own speciality) in designated form periods
- teachers needed to be provided with background material and to receive support from local health education and community dietetic services.

The evaluation aimed therefore not only to look at any effects the programme might have on the children but also to examine the feasibility of using non-specialist teachers in a non-examination teaching situation.

Basic plan of the programme

The aims as presented to the pupils were:-

1. To make a record of everything you eat and drink during one day
2. To look at what kinds of foods you eat and decide whether they are good or bad for health
3. To look at why you eat these kinds of food
4. To look at how your diet compares with those of others in the class.

Children completed a twenty-four hour diet record. They then looked at the frequency of consumption of different types of food namely:

- cakes, buns, biscuits and sweets
- bread, cereal, rice and pasta
- vegetables
- fruit
- fried foods

These were not intended to represent a food grouping system in the classical nutrition sense but to provide a practical framework for discussing the particular points at issue in this case.

The class then broke up into five groups, each of which collated class data on one of the five types of foods and looked at supplementary aspects of those foodstuffs. For example they discussed such topics as why people might choose white or wholemeal bread. Further work in the supermarket or greengrocers was also included, such as looking at the variety available. Each group prepared a presentation of their results for the rest of the class. There was then a discussion, guided by the teacher, in relation to the original aims. They discussed whether foods were good or bad for health (taking into account the quantities consumed), why they were chosen, the range of consumption within the class and the alternative options.

Evaluation

Time was a major constraint as the Parent Teacher Association was keen to pilot the scheme with third year pupils at the end of the summer term so that any necessary modifications could be made ready for the beginning of the school year in September when it was planned to use the scheme with a larger group of pupils.

The aims of the evaluation were:-

- To test the children's nutritional knowledge at the end of the course
- To investigate the children's attitudes to the project and to food
- To examine any changes of food intake (in relation to the five food types used in the scheme) on the basis of twenty-four hour records at the beginning and immediately after the programme
- To investigate the opinions of teachers about the project and to assess the viability of involving teachers who were non-specialists in this field.
- To monitor and adapt the project to increase its effectiveness and make it easier to teach.

Results

The monitoring of the classes indicated that the project proceeded rather erratically and tentatively. Much of the school work suggested was not carried out and this tended to limit useful discussion. Pupils apparently felt that as this was not an examination subject it was not worth spending time on it. If we consider changes in reported consumption of foods in various categories, there were some differences before and after the project. Also there were some marked differences between boys and girls, as is shown in Table 1.

Table 1 Frequency of intakes - School A

	Pre-test		Post-test	
	Girls	Boys	Girls	Boys
	Percentage		Percentage	
Sugary foods eaten four or more times a day	60	84	38	56
Fruit eaten at least once a day	87	53	77	37
Fried food eaten at least once a day	70	89	69	75

There appears to have been a decline in the consumption of sugary foods (cakes, buns, biscuits and sweets), but also a decline in fruit consumption. Respondents did in fact suggest that this was an effect of the strawberry season which ended before the second measurement. Although the boys seemn to have reduced their intake of fried foods somewhat there is no such shift amongst the girls, boys still having a higher level of consumption. Boys and girls showed similar increases in cereal consumption. At the first measurement 52.6 per cent had 'cereals' more than twice a day; after the course it was 71.4 per cent. In general vegetable consumption was very low and showed no signs of improvement.

Looking at the pupils' feelings about food and the factors influencing their choice, it seemed that the major factors influencing eating outside the home were the amount of money they had, the eating options available and their own taste preferences. Assessment of nutritional knowledge indicated that this was extremely patchy, but the pupils did seem to appreciate the value of variety and had grasped facts about sources of fat and sugar in the diet to some extent. When we consider pupil response to the project, as shown in Tables 2 and 3, the reaction was not very encouraging - over seventy per cent found it boring:

Table 2 How much have you learnt from the project?

	Girls	Boys
	Percentage	
A great deal	2	0
Quite a lot	8	7
Not very much	54	59
Nothing at all	36	34

Table 3 Do you think the project will make any difference to your eating habits?

	Girls	Boys
	Percentage	
It will make a lot of difference	0	2
It will make some difference	18	4
It will make very little difference	34	28
It will make no difference at all	48	66

In fact it appears that the exercise may even have been counter-productive. Sometimes in evaluating projects we may look for positive results without taking into account negative effects, saying only that we have not succeeded, whereas poor programmes may actually 'innoculate' people against future attempts at nutrition education.

The teachers did not feel that the programme, though useful, ran smoothly and they found that it took up much more time than they had anticipated. Some of the teachers did not look at the back-up material, feeling that they knew it already. They felt that the pupils were not very responsive and suggested that the scheme was more appropriate for a younger age group. These pupils had already covered some aspects of food and health in other parts of the curriculum. Other reasons which they suggested for the pupils' negative response were the time of year - they did not expect at the end of the summer term to start new work - and the pupils had previously used the form period as an opportunity to finish homework and they resented the loss of this time.

It seems fair to assume that the staff may also have been used to having this extra time available for preparation and administrative tasks and likewise felt unhappy about the intrusion. This may well lie in part behind the lack of enthusiasm for the whole scheme shown by some teachers. There was also a strong feeling on the part of the staff that they were being rail-roaded into participating because of pressure from the Parent Teacher Association.

Phase II of the Project

By chance another school in North London had heard what was going on and was keen to try out the project. This selective girls' school had an active tradition of health education and the teacher responsible was keen to do some work on eating habits with the first year girls (aged eleven and twelve years). Some modifications were made to the diet awareness sheet and class instructions based on the Cambridgeshire experience, but otherwise the procedure was repeated as before.

Results

Table 4 shows the changes in frequency of intakes of various food types before and after the project. Again there does seem to be a reduction in relation to sugary foods and a slight drop in fried food consumption. Unfortunately fruit and vegetable eating also appeared to decline and there was not the increase in cereals as shown in Cambridgeshire. The nutritional knowledge of this group was not markedly better than at School A, though it should be borne in mind that the children were on average two years younger. It is in reaction to the project that the greatest differences lie between the two schools. Tables 5 and 6 certainly show some improvement on the results obtained at School A, 66 per cent of the pupils found the project interesting.

Table 4 Frequency of intakes - School B

	Pre-test Percentage	Post-test Percentage
Sugary foods eaten four or more times a day	92	72
Fruit eaten at least once a day	86	65
Fried food eaten at least once a day	87	82
Vegetables eaten more than twice a day	80	77
Cereals eaten more than twice a day	83	77

Table 5 How much have you learnt from the project?

	Percentage
a great deal	12
quite a lot	52
not very much	26
nothing at all	7

Table 6 Do you think the project will make any difference to your eating habits?

	Percentage
it will make a lot of difference	10
it will make some difference	51
it will make very little difference	18
it will make no difference at all	22

The teachers found the programme useful, they thought it ran smoothly and that the timing was right. One teacher was particularly enthusiastic and full of ideas for follow-up work. In school B the teachers all had a science background but still said they found the back-up literature useful in answering questions. All felt the course could be handled by non-scientists provided that they were interested in the subject. All the teachers but one felt that 11 to 12 was the right age group for diet awareness work. These teachers also made detailed suggestions for modifications to the pupil worksheets and organisation or the tasks. In general the response was positive and a modified version of the scheme is now in use.

Conclusions

The evaluation provided the opportunity to compare different age groups as targets for diet awareness work and suggested that the younger pupils were more receptive. It was also possible to identify practical problems in the running of this particular programme. Once again it has reminded us of the need to generate enthusiasm amongst those who carry out nutrition education.

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6.5 Evaluation of a Nutrition Education Programme in the Ivory Coast

by

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Bouaké, the second largest city of the Ivory Coast, stands on the line separating savanna and forest. Today, this town has 320,000 inhabitants, twice as many as ten years ago.

In 1974 a Belgian pediatrician Dr P J Lamotte, recently arrived at the Hospital of Bouaké, noticed the failure of treatment of malnutrition: fifty per cent of young children died at the pediatrics department or left in their mothers' arms before the end of the treatment. The other fifty per cent, who went back home after treatment, remained a vulnerable group, since mothers were not prepared for the task of helping their children to achieve a good nutritional status.

The pediatrician decided to set up a nutrition education programme for the mothers of hospitalized children. The target group of this programme was composed of malnourished children's mothers, but other mothers were invited to attend the meetings. Three days a week, the mothers, who were hospitalized with their children, helped to prepare a meal for the children. They also received information about food classification, how to respond when the child refused to eat, and preparation of meals for every age group. For these demonstrations, the nurse-aides made use of a flannel board on which they hung posters, and they also used a slide projector. Each day during the treatment of a malnourished child, a nurse had an individual discussion with the mother. She gave the mother advice to help her child to become healthier.

In 1980, six years after the beginning of this programme, the pediatrician had become chief of the pediatrics department. He asked an educational research team from the University of Liège to evaluate this programme. This team belongs to the Laboratoire de Pédagogie Expérimentale, headed by Professor G. de Landsheere, and it has worked in the Ivory Coast for many years. I want to stress the fact that this pediatrician has twice turned towards education to improve his practice. First in 1974, when he set up this nutrition education programme, despite his superiors' advice. Secondly in 1980, when he asked educational researchers to evaluate his programme.

For the evaluation of this programme, the evaluators followed four guiding principles.

1. The first guiding principle was to clarify with the pediatrician the objectives of this nutrition education programme. Today, in the world of education specialists, the need for a clear definition of objectives, in terms of behaviour, is obvious. So it was thus the first educational help researchers could bring to the physician. Translating objectives into a teaching programme implies determining criteria at different levels. Nutrition education tries to introduce changes into knowledge, attitudes, behaviours and, at the final stage, into nutritional status.

To evaluate the acquisition of knowledge, we used a questionnaire. The same questions were asked at the beginning of the hospitalisation, and at home, seven days after the end of the treatment. We noticed an improvement of the knowledge of recipes, but not of the knowledge of food classification. This second objective is often considered to be necessary to acquire new feeding practices. It was not the case in Bouake, consequently the study of food classification was neglected for the benefit of a better understanding of feeding stages in young children.

With regard to the attitudes, the evaluation was built upon the voicing of the mothers' purposes at the end of their learning-period. For example, a modification of their intentions was noted with regard to their attitudes towards the child's refusal. After the learning-period the mothers more often declared that they would act in a more compelling way in case the child should refuse the proposed food.

At an intermediate level, criteria must be based on the change of diet habits at home. For this research, it was impossible to observe the mothers' behaviour at home, but they were asked questins about what their children had been eating and how their meal had been prepared. So the evaluators were able to compare the mothers' answers before and after their participation in the programme.

One question was: "What has the child been eating for the last three days?" The answer showed important modifications of the content and the preparation of the meals: the children were eating more proteins and more vitamins after their mothers' participation in the programme than they did before. More often the child's meal was prepared in its own dish, in order to adapt the meal to the child's needs.

The final criterion of success for such a programme is the nutritional recovery of the children. It can be measured by means of various ratios. We chose this the Kanawati and MacLaren ratio because we could use reference values laid down by the National Public Health Institute of Ivory Coast, and in this situation it was useful to use this as a measure of nutritional status. Using this index, the evaluators were able to conclude that, one year after the treatment, 60 per cent of the children had reached a better nutritional status.

Using this index, the evaluators were able to conclude that, one year after the treatment, 60 per cent of the children had reached a better nutritional status.

2. The second guiding principle was to build an evaluation which would be formative and summative

In a curriculum evaluation, formative evaluation is useful to correct the imperfections of a programme. The evaluators gave feedback to the pediatrician and to the nurse aides in order to improve the training. One year after the beginning of evaluation, an intermediate report made some recommendations. Some objectives of the programme were given up, some others were emphasized. Concerning methods, propositions were made: to have a discussion with the mother to allow feedback; to use a board in flannel with posters rather than a static board.

At the end of their work, the evaluators tried to make a balanced judgment about the programme. This summative evaluation was made at a very important moment. Ivorian physicians took the Belgian pediatrician's place at the head of the pediatrics department, when he left Ivory Coast in 1982. This summative evaluation was to be found in the final report which presented a full description of the programme, its objectives and its methods, an analysis of the characteristics of the target group, an evaluation of the successes and failures of the programme and a study of malnutrition causes in that context (Andrien 1983).

3. The third guiding principle was to evaluate the programme with quantitative and qualitative data

Both quantitative and qualitative data are required for a complete evaluation of a programme.

In one year, between July 1980 and July 1981, 156 malnourished children were hospitalized at the pediatrics department. Quantitative data came from their mothers' answers to a questionnaire. A sample of this population was asked the same questions one week after the treatment. Nutritional status was measured before and after treatment. So correlations were set between all the variables, factor analyses were also realized. This led the evaluators to define patterns of environments in which malnutrition occurs.

All these quantitative data are inadequate to understand how a programme works. Qualitative data were collected during frequent visits to the hospital. Evaluators had informal discussions with the nurse-aides and thus learnt about difficulties in implementing the programme:
- The nurse-aides did not like to use the slide-projector because they feared to damage it.
- The nurse-aides did not work with the same involvement because they had not been paid for three months.
- Some mothers refused to attend meetings, because from their point of view, the nurses had to care for their children and not to teach them cooking.

A good way to collect such information is the case study. In this research, case studies showed the great diversity of contexts in which malnutrition occurs. It was a complementary approach to the drawing of patterns I spoke of above.

To collect qualitative data, the research worker must have an open mind and soft methods of inquiry. He must open his eyes, open his ears and encourage people to speak of their everyday life. Without quantitative data, you cannot make up your mind about the success or the failure of a programme. Without qualitative data, you are not able to understand this success or failure.

4. The fourth guiding principle was to give a large place to anthropological approach

In Africa, many educational actions are developed without knowing the way of life, the customs, the habits, the cultural attitudes of the people who are concerned in these actions.

Each ethnic group has totems: each child gets his personal totem. Moreover, young children cannot eat the same food as the adults. For some people in Ivory Coast, to eat flesh or eggs is to meet the 'sacred things'. It is very dangerous to expose very young children to the 'sacred things'. Therefore the parents will never give an egg or meat to their children before they are two or three years old. Before teaching the mothers to prepare eggs for their children, it is necessary to estimate the possibility of changing the family's habits and the cost of this change.

What is the meaning of the feeding habits in the cultural context in which one wishes to interfere? What is the food classification used? What is breast-feeding associated with? At what age does a child eat with grown-ups? When you are building or evaluating a nutrition education programme, these questions must be answered. Anthropology can help the research worker to understand the cultural context in which he wants to fight malnutrition. Thereby he can adapt the objectives of the programme or his judgement on the programme, and increase the efficiency of his action. To adopt an anthropological approach is also the best way to respect the populations you are working with.

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6.6 Workshop discussion

The workshop discussion was broad in its scope and the importance of the cultural context and organisational framework within which nutrition education programmes take place was stressed. It was emphasised that there was a need for anthropological skills in the early stages of planning a nutrition education project. Food habits can be notoriously difficult to change and, without an understanding of the cultural reasons for them, education designed to improve nutritional behaviour is likely to be found unsatisfactory. This understanding is essential before developing the project's objectives and thus establishing the evaluation framework. (Yet such preliminary anthropology is often left out either because the need for it is not understood or because it is not given sufficient priority).

Projects take place against a changing socio-economic background. An anthropologist's appreciation of these trends in development is useful not only at the stage of project planning but also in evaluation. It enables the progress of the project to be seen in the context of the wider society. It was felt that it is important to involve the community who are to receive the nutrition education in the project from the outset. Group discussions at the planning stage can provide base-line information as well as helping appropriate and realistic objectives to be set. Feedback from the community is a sensitive tool in on-going evaluation, enabling the project to adopt improvements as it progresses. The results of formal evaluations should be discussed with the community to analyse reasons for failures and to receive their proposals for future nutrition project programmes.

The uses and limitations of certain conventional tools of evaluation were discussed - the questionnaires which showed changes in knowledge but were otherwise often unreliable, the time-consuming but more accurate observation of changes in food habits and the problems in collecting, analysing and interpreting data on changes in nutritional status. Differences between the recognition of a nutrition 'message' and its comprehension were important, particularly with school-children. Process evaluation needed to include indicators such as the number of teachers taking part in a nutrition education project and the number and type of activities held. The success of a project often depended on an individual teacher's enthusiasm, something that often eludes conventional evaluation.

There is a clear need for a wider knowledge of simple techniques of evaluation on the part of those planning nutrition education projects. Then evaluation mechanisms can be built into the plan and can be seen as a means of monitoring progress and achieving improvements. Final evaluation by an independent body, often needed to renew a project's funding, can be perceived as a threat or a judgement, unless the project-staff are already used to self-evaluation. Cooperation between evaluation and project staff is essential if outside evaluation is to be constructive and techniques for achieving this were discussed.

Many nutrition education projects, particularly those run by voluntary organisations or enthusiasts from other professions, have started without proper base-line data and 'just growed'. Formal evaluation methodologies are difficult to apply and inappropriate in such circumstances. Suggestions were made as to how these projects could be assessed and how the results of the assessment could be used to develop or realign the nutrition education given.

In conclusion the group felt that evaluators need to be flexible in approach and able to choose from a variety of techniques (including methods from the social sciences) those most suited to assessing a particular project.

CHAPTER 7

THE USE OF MEDIA IN NUTRITION EDUCATION

The twentieth century has been a time in which the mass media have become an increasingly potent force in communication, although their potential as a vehicle for education about nutrition has still to be realised in many parts of the world. Examples of the ways in which the media have already been used to diffuse nutrition messages in Thailand are described with great clarity by Sakorn Dhannamitta. She is engaged with her colleagues in research on the influence of various types of media in the education of village communities. It is striking that the way in which their project was set up, developed and evaluated, meets the criteria proposed by Maria Teresa Guzman. It provides a most interesting example of how modern technology and teaching methods can be used to improve nutrition education.

Maria Teresa Guzman provides a comprehensive model of how the media may be utilized in the transmission of nutrition education programmes. She identifies the steps necessary for the production of material appropriate for particular groups within a community. This includes an account of the initial research needed to develop a theoretical model of the nutritional needs of a whole population, and of one directed at those most at risk, such as families with low incomes. We believe that the model they describe deserves careful study, and that it might be used or adapted by other countries. Delegates to the conference considered that this kind of careful planning could be an important step towards improving nutrition education of the public.

The use of the media in promoting nutrition education is frequently a subject of debate, and a timely note of caution is introduced by Abdulrahman Musaiger in his paper entitled 'Can nutrition education compete with advertising messages in developing countries?' As the author points out, the issues raised are applicable to all countries in which the media have influence. It should be emphasised that the media, both in advertising and through radio programmes, have the power to influence people's attitudes and increase their knowledge. Nutrition educators have a responsibility to try to ensure that the messages conveyed are as accurate as present knowledge permits, and that they are unbiased. The standards discussed by Maria Teresa Guzman and Abdulrahman Mesaiger need to be observed by all those involved in the production of programmes.

The chapter concludes with a summary of the workshop discussion on the use of media, and a report on some of the programmes recently produced by the British Broadcasting Corporation for Schools' television which were shown and introduced by the series producer Michael Coyle.

Contributors

7.1	Sakorn Dhannamitta, Pattanee Winichagoon, Suttilak Samitasira and Aree Valyasevi	Nutrition education by video-tape and radio in promoting appropriate supplementary feeding at community levels
7.2	Maria Teresa Guzman	Nutrition education strategy through mass media
7.3	Abdulrahman Musaiger	Can nutrition education compete with advertising messages in developing countries?
7.4	Workshop discussion	

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7.1 Nutrition Education by Video-tape and Radio in Promoting Appropriate Supplementary Feeding at Community Levels

by

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In Thailand, approximately fifty percent of infants and pre-school children suffer from protein-energy malnutrition. (Ministry of Health, 1981). The highest prevalence is observed in the north-east region of the country. During the Fourth National Economic and Social Development Plan (1977 to 1982), the National Food and Nutrition Committee was appointed. Since nutrition education is one of the main policies of the National Food and Nutrition Plan, a sub-committee on Mass-Communication was formed. At the same time, the Institute of Nutrition was established to assist and strengthen the plan.

Nutrition education activities have been carried out by the Ministries of Health, Agriculture, Education and Interior, as well as other nutrition related agencies. However, the major method used is confined to inter-personal communication techniques. Normally, printed materials are used as the main teaching aid. Audio-visual aids, such as sound film, sound slide or radio have not been utilised to their full potential. Various constraints, such as functional illiteracy, lack of infra-structure, expensive technology and under-developed techniques have made communication efforts in nutrition education at the community level minimal and difficult. Communication for behaviour change and development appears to be at an early stage and needs more extensive research.

To achieve the goal of solving malnutrition, the Institute of Nutrition has attempted to carry on several nutrition training and research programmes. Community-based nutrition research programmes are conducted in the north-east areas where immediate action was called for. Our results have shown the need of integrated nutrition, health, food supply and income generation activities for an effective nutrition programme (Sakorn Dhanamitta et al. 1981). Nutrition education was found to be an essential component of nutrition activities in combating malnutrition. It plays an important role in increasing the mothers' awareness of proper infant feeding practices, as well as family diet.

The Institute of Nutrition, in an attempt to find a better approach to nutrition education or communication, initiated a study on the use and effectiveness of interactive video-tapes and radio programmes. The objective was to study the methodology in media production and dissemination through the existing infra-structure, as well as the effectiveness of the media as a means of nutrition education for rural mothers. The design of the study was based on the use of two media singly and in combination, to determine the best utilisation of media in promoting appropriate supplementary feeding for children from birth to four years old.

The media promoted both improved dietary habits and the use of nutritious products. The products were formulated by the Institute of Nutrition for the home or village base supplementary food (Kraisid Tontisirin et al. 1981). The nutritious formulas used locally-grown ingredients, and the processing was simple and accessible at community level. All formulas were rice-based, with the combination of legume and sesame seeds or groundnut. The products appeared to be well accepted in the previous field study. Therefore, it was decided worthwhile to promote the use of these types of supplementary foods.

The project included 48 villages in Ubon and Sri-Sa-Ket, provinces of the north-east areas. Each of these villages was randomly assigned to radio, radio plus television, television alone and control conditions. Twelve villages were included in each condition. The study design can be shown as follows:

Ubon	Sri-Sa-Ket
TV	TV + Radio
Control	Radio

It was hypothesised that the combination of television and radio should yield the best impact. Television, the advantage of which was the provision of both audio and visualisation, could be brought to the villages by video-van. Radio, through the existing radio network, broadcasting frequent, short and easily-remembered messages, should help learning. Equal time of exposure to both media had been arranged in this study. The study was launched in February 1982. Two base-line data collections were performed in May 1981 and January 1982. Prior to project implementation, a media production team and supplementary food production team provided support.

The supplementary food product called ' Luk Rak' consists of rice, mung bean and sesame or groundnut with various flavours. These have been produced and used as an educational tool as well as an indicator to measure the effectiveness of the media in terms of behaviour change. The food product was sold at the lowest possible price to provide the project with a revolving fund for the raw materials.

Four modules of video-tape and radio spots were produced. The messages on proper supplementary feeding and related sound nutrition practices were prepared. Two 30 second and twelve one-minute radio spots were produced for broadcasting and 25 five-minute radio spots were also produced. The content of the radio spots corresponds to the video-tape. All the tapes and radio spots were tested before dissemination. The content of the four modules were as follows:

1. "Loved Baby" - the message emphasized recognising malnutrition in young children, the consequences of protein-energy malnutrition and the importance of food and proper supplementary food to the health of 0-4 year old children.
2. "Let's cook Luk Rak" - showed the cooking method of the food products, and methods to encourage the child to eat more food.
3. "Breast-feeding" - emphasised an adequate diet for pregnant and lactating mothers, and promoted proper breast-feeding practice.
4. In "Here Comes Dr. Nit" the emphasis was on "mental feeding".

Prior to project operation, an informal meeting with village headmen and key informants of all villages was held by the research team. The importance and rationale for the study were discussed. Two village health communicators were then selected per village. They were trained to be product distributors in each village, since the programme was planned to operate in the context of Primary Health Care.

Three days' training was arranged for ninety-six village health communicators in two provinces. The training provided information about the job and areas of responsibility, general knowledge in nutrition, proper supplementary feeding and related matters, knowledge about food products and record-keeping, as well as persuasion techniques. Manuals were provided to remind them of the important points of the messages. Motivation sessions and group dynamic sessions in the evening appeared to be very useful in obtaining their active role in performing their job. Records of the number of sales and lists of the buyers and consumers were kept by these village health communicators. Changes in knowledge, attitude and practice of the target audience (mothers of 0-4 year old children in the villages) were appraised. Nutritional status of the 0-4 year old children, which was the indirect target of nutrition education, was assessed twice, in May 1982 and January 1983.

Photograph 1 The video-van visited the TV villages once a week to show the video-tapes and supply the villages with "Luk Rak"

The video-van, equipped with video-tape player, started its media dissemination operation in February 1982. The van visited each of the forty-eight villages once a week and less frequently during the farming period (June - December). The video-tape was shown in twenty-four villages, while the supply of food products was brought to all forty-eight villages by the same van. In villages where the video-tape was used, the 'interactor', who rode in the van, acted as a stimulator to create interaction between the video-tape and the audience, mainly the mothers. His other job in all forty-eight villages was collecting the records, money and re-supplying the products. Village health communicators were able to discuss problems or difficulties with him. He noted observations or remarks, which were found very useful for the improvement of the project.

Photograph 2 The "interactor" helped the mothers to give their answers to the questions posed on the TV.

Each video-tape was approximately thirty minutes long. Interaction created by asking and answering questions made the total showing time about forty-five minutes. For the radio area, one minute and thirty-second radio spots were broadcast by Radio Sri-Sa-Ket seven times a day. The five-minute radio programme was broadcast once a week on Sundays. This ensured that the exposure time in both media was equal. During the one-year operation from February 1982 to January 1983, each of the four modules was shown four times to village mothers and once to the school children. Preliminary observation of the first evaluation showed that modification of both media was required, and this has been carried out. Food product development has also been carried out to improve selection and to avoid boredom.

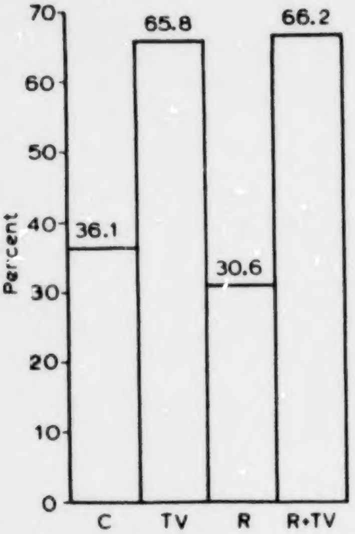
The overall evaluation was carried out in May 1982 and January 1983. Approximately 2,500 mothers were interviewed and 3,000 infants and pre-school children were weighed in each evaluation. Preliminary results from the first impact evaluation in May 1982 showed that the clarity of the messages and the questions were crucial in the video-tape programme. It was found that the more correct answers that were obtained during the interaction, the more motivated the audience was to participate in the nutrition education process. Since audience participation would facilitate learning, the active interaction was crucial. However, it was clearly shown that the clarity of the message which led to correct answers depended on clear visualization followed by audio. Therefore message technique was very critical. A preliminary survey for radio message exposure showed that the thirty second song could be well recognized. The one-minute radio spot was less well understood by the mothers, possibly due to its long and complicated messages. Single concept radio spots with repetition at the point of emphasis appeared to be one way of improving the radio spots.

When the knowledge and attitude of the mothers were evaluated, there were clear-cut results in the changes of the village mothers who were in the villages exposed to television programmes. Examples for these changes from the first evaluation in May 1982 are as follows:

1. Nearly twice as many mothers in the television conditions ("TV condition" and "Radio and TV condition") reported giving their babies colostrum, compared to the non-TV villages (Figure 1).
2. Less than half as many mothers in the TV conditions said that they discarded colostrum because it was useless (Figure 2).
3. In the TV conditions, mothers were more likely to name 'Luk Rak' when asked about special food for children (Figure 3).
4. More mothers in the non-TV conditions said they had never heard of 'Luk Rak" (Figure 4).
5. Mothers in the TV conditions were more than twice as likely as the mothers in the other conditions to specify the correct way to mix and cook 'Luk Rak'.
6. Mothers in the TV conditions were most likely to play with their children and cajole them to continue eating if they rejected food, whereas mothers in the non-TV conditions were most likely to give up and quit trying to feed them.

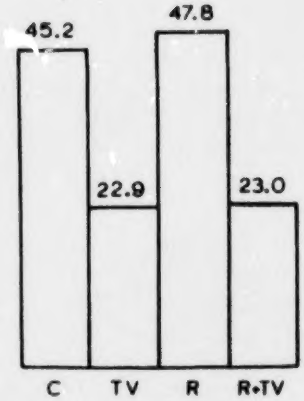
VTR/Radio impact evaluation - mothers' response - May 1982

Figure 1



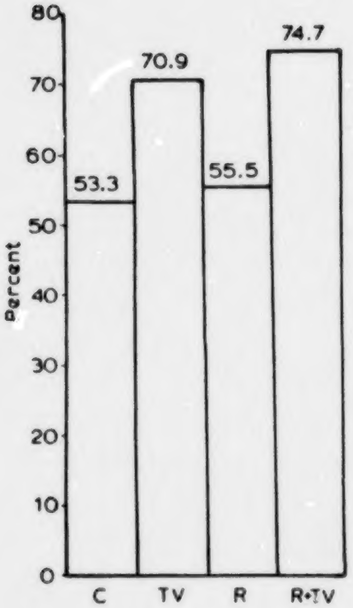
Reported giving of colostrum

Figure 2



Reported not giving colostrum because it has no value for child

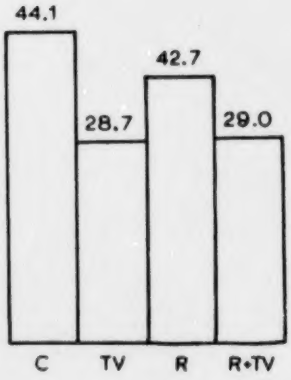
Figure 3



Named 'Luk Rak' as child food

Figure 4

"L - R" Non Users. N = 931



Reported never heard of 'Luk Rak'

Improvement of nutritional status in infants and preschool children could not be detected in the first impact evaluation, due to the shortage of time duration in implementation, which was only 3 months. However, it was found that seasonal variation existed, and some independent variables, such as total number of 0-4 year old children, child's age, number of documented birth dates, etc., should be taken into consideration for a better interpretation of the change in anthropometric measurements.

The sales of the supplementary food products in the four conditions have not shown any contributing effects from the media yet. Though the number of sales had a tendency to increase, other factors appeared to affect the number of sales in addition to the effectiveness of the media. These factors included the choice of cooking and feeding methods, and the availability of the product itself. The enthusiasm and active role in performing the job of the distributors or village health communicators were found to be crucial.

Further results collected at the second evaluation in January 1983 should bear more conclusive results in the overall evaluation.

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7.2 Nutrition Education Strategy Through Mass Media

by

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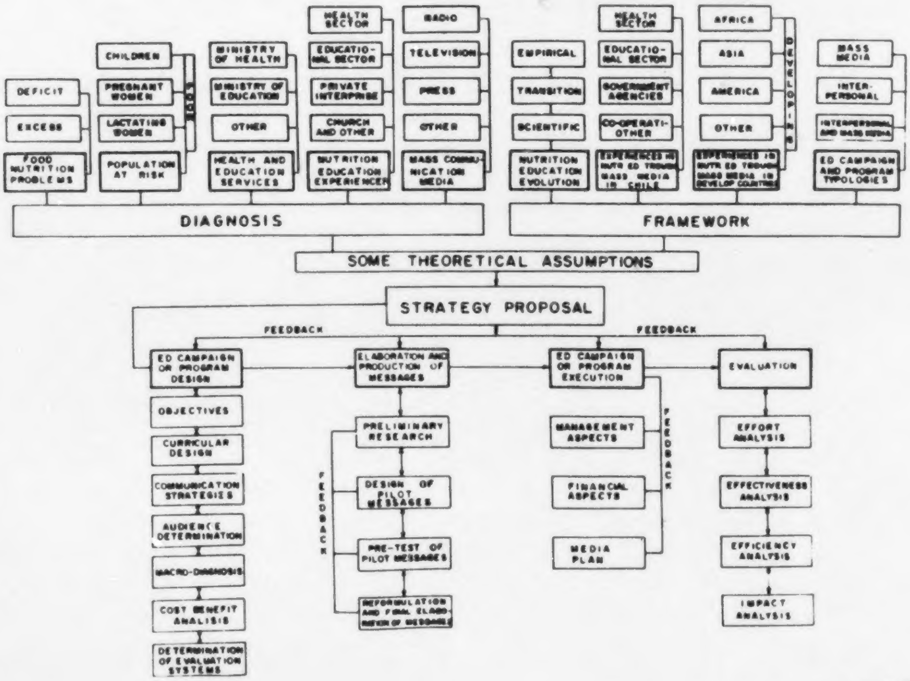
Throughout the world there is general recognition that the problems related to food and nutrition are multifaceted. This is evident in Chile, where, as a result of the socio-economic situation, there has been a constant decrease in the food-purchasing power of some socio-economic groups which, combined with deficient food habits and knowledge, have resulted in inadequate food consumption in the majority of the Chilean population. This has resulted in well recorded nutritional problems, and the question arises as to how improvement can be achieved. Undoubtedly any solution must focus on the multi-causal aspect of the problem, and use this as a basis for change. From this view point, nutrition education appears as an adequate mechanism by which the population, with economic limitations, may enjoy adequate nutrition by incorporating better systems of production, selection, preparation, conservation and biological utilisation of food.

This task requires a definition of Nutrition Education Policies that comprises all sectors (health, educational, agricultural, etc.) and all levels. Aware of this need, the Division of Food and Nutrition Policies and Programmes belonging to the Institute of Nutrition and Food Technology of the University of Chile is devoted to the task of delivering background information and proposing alternative strategies in different areas. It has become involved in the formal system of education by proposing a programme that encompasses the teaching of nutrition at primary and high-school level, as well as the respective family group: it has also studied the food habits and knowledge of the students that enter the University as well as those of their teachers; and, at present, it is working in the area of Agriculture and Nutrition.

The general purpose of this work is to provide an analytical summary of how mass media communication has been, and is being, used in efforts to improve the standard of living of the population, especially in developing countries, and to suggest an alternative strategy model of Nutrition Education through mass media that is in accord with national reality, and that might be used or adapted in other developing countries.

Figure 1: A Mass Media Nutrition Education Strategy


DEFICIT
EXCESS
FOOD NUTRITION PROBLEMS
CHILDREN
PREGNANT WOMEN
LACTATING WOMEN
POPULATION AT RISK
MINISTRY OF HEALTH
MINISTRY OF EDUCATION
OTHER
HEALTH AND EDUCATION SERVICES
HEALTH SECTOR
EDUCATIONAL SECTOR
PRIVATE INTERPRISE
CHURCH AND OTHER
NUTRITION EDUCATION EXPERIENCES
RADIO
TELEVISION
PRESS
OTHER
MASS COMMUNICATION MEDIA
EMPIRICAL
TRANSITION
SCIENTIFIC
NUTRITION EDUCATION EVOLUTION
HEALTH SECTOR
EDUCATIONAL SECTOR
GOVERNMENT AGENCIES
CO-OPERATI-OTHER
EXPERIENCES IN NUTR ED THROUGH MASS MEDIA IN CHILE
AFRICA
ASIA
AMERICA
OTHER
DEVELOPING
EXPERIENCES IN NUTR ED THROUGH MASS MEDIA IN DEVELOP COUNTRIES
MASS MEDIA
INTER-PERSONAL
INTERPERSONAL AND MASS MEDIA
ED CAMPAIGN AND PROGRAM TYPOLOGIES
DIAGNOSIS
FRAMEWORK
SOME THEORETICAL ASSUMPTIONS
STRATEGY PROPOSAL
FEEDBACK
FEEDBACK
ED CAMPAIGN OR PROGRAM DESIGN
OBJECTIVES
CURRICULAR DESIGN
COMMUNICATION STRATEGIES
AUDIENCE DETERMINATION
MACRO-DIAGNOSIS
COST BENEFIT ANALISIS
DETERMINATION OF EVALUATION SYSTEMS
ELABORATION AND PRODUCTION OF MESSAGES
PRELIMINARY RESEARCH
DESIGN OF PILOT MESSAGES
PRE-TEST OF PILOT MESSAGES
REFORMULATION AND FINAL ELABORATION OF MESSAGES
FEEDBACK
ED CAMPAIGN OR PROGRAM EXECUTION
MANAGEMENT ASPECTS
FINANCIAL ASPECTS
MEDIA PLAN
FEEDBACK
EVALUATION
EFFORT ANALYSIS
EFFECTIVENESS ANALYSIS
EFFICIENCY ANALYSIS
IMPACT ANALYSIS

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The stages that were followed for this strategy were jointly planned and were modified as necessary, although the original outline was left untouched, so that we could fulfil the objectives that had been stated. The most important phases are summarised in Figure 1 and include:

- Country diagnosis based on the collection and analysis of background information.
- Statement of a framework.
- Elaboration of basic theoretical assumptions.
- Proposal of a Mass Media Nutrition Education Strategy that included four successive sub-stages.

A concise presentation of each of the aspects that were studied will be included as we consider that the models that were followed could become an important contribution to studies related to the planning of Mass Media Nutrition Education Strategies.

I Country Diagnosis

Five basic aspects were considered:

- Identification of the most important nutritional problems of the country and the possibility of their being tackled by nutrition education. This included identification of the affected population in relation to bio-statistical indicators such as sex and age.
- Characterisation of the population nutritionally at risk. Although in Chile food and nutrition problems are widespread, low-income sectors are more seriously affected, particularly children, pregnant and lactating women. Thus it was important to identify the population at risk, who would be considered as the target group, their food habits and beliefs as well as the magnitude of the nutritional food problem within the population of lowest income.
- Health and Education Services, and ways in which they could support any proposed educational measures. This involved a study of the infrastructure and of available resources, as well as the programmes that were being carried out in connection with food and nutrition.
- Experiences in Nutrition Education in Chile to determine those which could be used as a basis for formulating new strategies.
- Mass Media. Only the main media, namely radio, television and the press were considered, as they have higher impact on the public. The number of radio receivers, television sets, and newspaper editions in relation to population was studied; as well as audience rates, possession of receivers in different population groups and media-usage habits.

II Framework for a Mass Media Nutrition Education Strategy

Four aspects were analysed in the elaboration of the framework:

- Historical development of Nutrition Education. Of particular relevance is the phase from the beginning of the 1970s, extending up to the present, that stresses the need for planned nutrition education and points out that the nutritional problem is multifactorial, that is, that it is not only a nutritional problem, but also a problem of education and communication. This implies a change in the criteria applied to the choice of the professionals who are responsible for the introduction of new methodologies that include modern techniques at the disposal of education. The use of the mass communication media is one of the modern techniques that has lately become generalised in nutrition education with the intention of spreading messages with an educational nature in the widest and most generalised possible way.

- Nutrition Education experience through mass media in Chile. A diagnosis was carried out in connection with the utilisation of mass media in Nutrition Education Programmes so as to gather information that allows the proposal of other alternative strategies for Chile. The conclusion was that there was an under-utilisation of mass media, evaluation deficiencies, and a lack of programme documentation that reduced the possibilities of using these experiences as a basis for future programmes.

- The use of mass media in Nutrition Education in other developing countries was examined. The evaluation of the different mass media nutrition education programmes showed that they produced impact in the promotion of changes in knowledge, attitude, and behaviour of the population. The effectiveness of the nutritional education campaigns or programmes through mass media would depend on the planning approach as well as the control and evaluation of the programmes.

- Campaign and Programme Typologies. The success of a Nutrition Education Programme will depend, basically, on the communication strategy selected to carry it through. The need to rationalise resources and to obtain optimum results force the planner to choose those alternatives that appear to be the most appropriate for the stated purposes and which meet the previously determined criteria.

In the mass communication media, three basic programme formats for radio and television can be combined or modified according to need. First, the Spot in which a commercial format is used, but with an educational content. It has an approximate duration of thirty to fifty seconds, and it delivers a simple non-sequential message that is valuable in itself. It is based on the systematic repetition of the message as well as on its simplicity. Second, the Miniprogramme; which may last from one to ten minutes. It presents a non-sequential message and deals with a specific problem. It is based on the message being delivered as a unit, condensed synthetically. And third, the programme, which is the longest lasting (between ten and thirty minutes) and may, or may not, be sequential. The programme characterises itself for being based on a thematic unit of higher development than the previous two. There are many ways of combining or adapting the different alternatives that have been presented. It is important to point out that many of these methodologies have not been applied systematically, and often when they have, they have not been evaluated, which makes it very difficult to forecast the success of the programmes.

There is a consensus, though, that the possibility of success is higher when more communication channels and strategies are used. Therefore, in developing countries that have limited budgets, resources must be rationalised, and existing channels should be adequately used as a way of enlarging the range of possibilities.

III Nutrition Education Strategy Through Mass Media

There are a number of alternative strategies for nutrition education through mass media. A Communication Strategy, in this context, is a set of assumptions and criteria organised in a plan or programmatic design, oriented to modify human conduct on a large scale by means of the transmission of new ideas that can contribute to the improvement of the nutritional status as well as to the health of a target population.

Given the general characteristics of the country, and considering all the elements that have already been described in the framework, we propose a nutrition-education alternative that, using mass media, could reach different target groups and - as a priority - populations nutritionally at risk by means of campaigns or programmes that could be designed, executed and evaluated systematically. Considering the most important programme modalities for mass media, the valuable potential that can be supplied by Marketing and Publicity techniques, (Solomon, 1979) the communication Sciences (Rogers 1976, Hornick and Solomon 1978) and the Psychology of Learning (Zimbardo et al, 1977) we propose an integrated approach that considers some important aspects of each area and that allows the realisation of effective work in the field of nutrition education. The strategy that we propose is based on eight basic assumptions, some of which have already been pointed out by other authors:

1. The education opportunities must reach the population, rather than the population having to seek for them. In other words, the educational message should be taken to their homes, their jobs and their places of entertainment.
2. The education message must reach the population frequently, in an understandable way. Messages should be short, simple and reiterative. It is advisable to deliver the educational messages between entertainment programmes that have large audiences, using the same approach that commercials use to promote their products.
3. The educational message should be consistent in all the media used.
4. Message design conditions the success or failure of the mass media nutrition education. Messages must be simple, adequate and valid for the target audience.
5. A new communication infra-structure is not needed.
6. All campaigns or programmes should be based on research. This requires diagnosis and initial evaluation, and ends with a final evaluation, along with an intermediate state that contemplates a preliminary research design and testing of messages.
7. The mass communication media is more useful in creating favourable knowledge and attitudes, but is more limited in obtaining behavioural changes in relation to an innovation. This means that the mass media (radio, press, television, books, cinema) are not sufficient to produce deep behavioural changes within the population, and that supporting interpersonal communication channels are required.
8. In order to obtain more effective changes in behaviour, a mass media campaign must consider a multi-media strategy based on interpersonal communication. It becomes necessary, therefore, to co-ordinate the programmes with existing health and education infrastructures.

The alternative that is proposed represents only one possibility within an extensive programme and modality range that can be carried out. The one chosen will depend on the characterisitcs of the country, the target population and the food and nutrition problems to be tackled. This strategy states the basic aspects that will have to be considered to carry out a food and nutrition education campaign or programme through mass media, whether it is in a province, region, or in a whole country. Four aspects are considered: (1) educational campaign or programme design; (2) message elaboration and production; (3) educational campaign or programme implementation; (4) evaluation.

1. Educational Campaign or Programme Design This includes:

- Formulating institutional, nutritional and educational objectives.
- Curriculum Design includes the formulation of objectives, the determination of content, the selection of a learning strategy, materials and media and the choice of evaluation criteria. It is important that the objectives should be stated in a realistic way and that it is possible to measure them through evaluation.
- Communication Strategy. The selection of the strategy involves decisions about the communication model, which ideally should give the audience a participating role. The type of campaign and channels chosen will depend fundamentally on the campaign content and objectives, on the characterisitcs and prior knowledge of the audience, on the media coverage and population access to them, as well as on the human, financial and material resources that are available. One or more media may be utilised.
- Determination of Audience. This often involves deciding on groups which should have priority, as audience segmentation provides certain benefits in terms of designing appropriate programme material.
- Cost/benefit analysis. The alternative that is selected needs to be the most profitable, in economic terms, as well as the most effective in educational terms with regard to existing resources.
- Determination of the evaluation system. Reliable evaluation will enable the results of the campaign to be measured in terms of their impact and effectiveness, and it is therefore important that the evaluation mechanisms be carefully chosen. (See Figure 2). Three kinds of evaluation must be planned: base line or diagnostic evaluation, formative evaluation and summative evaluation.

2. Message and Programme Elaboration and Production

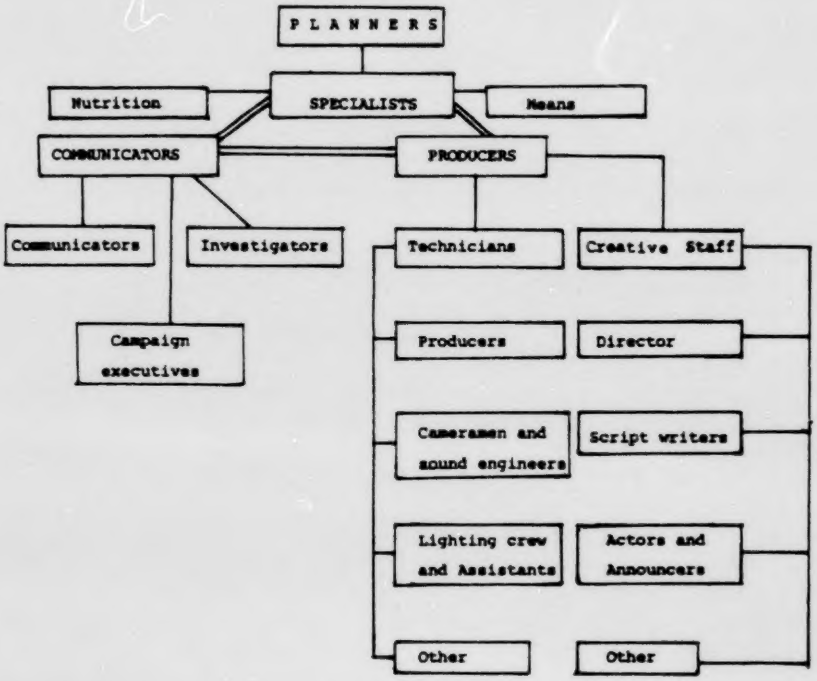
The impact of a campaign greatly depends on the way messages are designed and presented through mass media. In message and/or programme elaboration and production, it is convenient to consider four basic stages: preliminary investigation; pilot-message design; pilot-message testing; and message reformulation as well as definite message production. We think that at this stage it is necessary to go into the community and study the food habits and special characteristics of the community. Preliminary investigation involves obtaining information about such aspects as the audience's attitudes, needs and doubts pertaining to the ideas, products or food uses the campaign would promote. The idea is to become acquainted with those aspects of the message (or messages) that should be stressed, and the way in which these messages should be presented to the audience, according to the ideas they already have on the subject. Message impact increases considerably when it is simple, attractive, interesting and well presented. So as to have effective messages it is fundamental that all the different groups involved should work closely together; this includes the health and nutrition specialists, who will have the last word as far as content is concerned, the professional team (investigators and communicators) that has participated in the previous campaign or programme stages, as well as the production team such as directors, script writers, and cameramen.

Figure 2 Evaluation System

Type of evaluation	When	Objectives
1) Diagnostic	Before	a) Collects information on target population. b) Detects problems and needs in the priority areas
2) Formative	During	a) Contributes to the production of messages b) Collects information on the management aspects of the campaign
3) Summative	After	a) Studies the different categories of evaluation

Pre-testing involves groups similar to the target population, and provides information on transmission of messages and how they are perceived by the recipients. The aim of pre-testing is to seek comprehension, credibility, and message intention from the viewpoint of the audience, so as to cause definite message-production feedback, and elaborate a set of messages of high technical and communicative quality. It is practically impossible to elaborate a perfect strategy or flawless nutrition education message or programme, as many of the influencing variables are uncontrollable. It is possible, though, to take measures that theoretically ensure at least partial success. It is common to see that failure is due, in part, to the fact that strategies, programmes and messages are elaborated from the viewpoint of the planner, without actually considering the needs and characterisitcs of the audience. Feedback gives the guidelines for the definite elaboration of the message concerning such areas as language to be used, and content. The stage of message reformulation and definite production needs integration of the different technical teams on which the responsibility of the elaboration rests. (See Figure 3).

Figure 3 Team required for the production of programmes


PLANNERS
Nutrition
SPECIALISTS
Means
COMMUNICATORS
PRODUCERS
Communicators
Investigators
Campaign executives
Technicians
Creative Staff
Producers
Director
Cameramen and sound engineers
Script writers
Lighting crew and Assistants
Actors and Announcers
Other
Other

3. Programme or Campaign Execution or Implementation

When executing the campaign, it is convenient to consider the management and financial aspects as well as the media planning. A study of the campaign or programme expenses is of great importance. It often happens that programmes cannot be put into practice due to the fact that funding comes to an end before the anticipated time.

It is at this stage that there should be a public relations campaign, to involve other organisations and other institutions, so that they receive and accept the proposed programme. Media planning includes selection of the media, such as the television station, radio stations and newspaper(s) through which the different messages will be transmitted, planning the transmission or publication timetable, and deciding what message and programme will be transmitted.

4. Evaluation

Three types of evaluation have already been pointed out (see Figure 2). The criteria which may be used in the summative evaluation of a programme

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or campaign include:

- Effort analysis which determines the success criteria in relation to the quantity and quality of the activities carried out.
- Efficacy analysis which measures campaign results by comparing the objectives that were proposed and the success obtained.
- Efficiency analysis which studies cost/benefit in connection with the different programme alternatives.
- Impact analysis, which considers the degree of success of the programme.

Although there may be other evaluation categories and criteria for judging the success or failure of a determined nutrition education campaign or programme through mass media, we have only considered those that we felt are the most important.

Concluding remarks on the Proposed Nutrition Education Strategy

In a mass media nutrition education programme or campaign, there are certain elements that the communicating team can control, as well as others it cannot. These elements determine whether communication between the team and the audience or target population will be a success or a failure. The communicator may control some factors such as the selection of the communication strategies and all the stages that include message and programme elaboration and production. Although it is true that these stages are costly, they increase the likelihood of the programme being successful. It must also be pointed out that these stages also have a considerable educational value; the more we know about the audience, the better the chances of obtaining the desired behaviour changes so as to improve the standard of living of the selected population. The elements of the proposed strategy as well as their inter-relationships are shown in Figure 1.

The Model of the Nutrition Education Strategy outlined is a contribution to the study of alternatives of Food and Nutrition Policies in Chile, but it could, of course, be used or adapted by other developing countries.

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Editor's Note

As this paper represents a summary of the original work, the authors have prepared a comprehensive reference list, part of which is included below. Unfortunately there is not space to include the entire bibliography.

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7.3 Can Nutrition Education Compete with Advertising Messages in Developing Countries?

by

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Recently, mass media have made a great impact on consumer behaviour. People in many countries spend a considerable amount of time watching television, listening to radio, reading the press and going to the cinema. In fact, the time spent on such activities is more than on any other, except for sleep. These communication channels affect social development by changing people's attitudes and beliefs.

Advertising involves all mass media, but its commercial concepts lead to concentration on profit rather than on the health of the people. Advertising may therefore persuade people to purchase food products which are less nutritive than might be desired. This paper discusses the influence of advertising on food habits, and the need to apply an effective nutrition education programme, as well as to control food advertising in developing countries.

The Influence of Advertising on Nutrition Knowledge and Attitudes

The lack of effective nutrition education programmes in developing countries, in addition to high rates of illiteracy, may lead people to believe advertising claims that are nutritionally misleading. In Bahrain, Musaiger (1980) found that 55.7 per cent of housewives believed that television food advertisements increased their nutrition knowledge. The percentage was lower in high social classes (47.2 per cent), compared with low (56.1 per cent) and middle (59.3 per cent) social classes. He also found that 74 per cent of housewives agreed that food advertisements let them know about good and healthy foods, while 62.8 per cent agreed that all the foods they advertised on television are good and healthy. It is likely, however, that many people are neither familiar with nor even understand the meaning of nutrition terms claimed in advertisements. Vermeersch and Swenerton (1980) showed that interpretations of claims in food advertisements were associated with educational level. Those with low educational levels and low income levels were vulnerable to the misinterpretation of nutrition claims in food advertisements. In Calcutta, USAID (1972) reported that the majority of the mothers were unfamiliar with the terms 'carbohydrates', 'protein', 'fat', 'minerals' and 'vitamins'.

The fact that illiteracy and ignorance are predominant in developing countries makes it possible for advertising to play an important role in affecting the beliefs and attitudes of consumers. In Bahrain, for example, Musaiger (1983b) found that about 42 per cent and 47 per cent of housewives believed and moderately believed in food advertisement claims, respectively. In low social classes, 52.8 per cent of housewives believed claims in food advertisements, compared with 32.4 per cent and 17.4 per cent of housewives in middle and high social classes, respectively.

The Influence of Advertising on Food Habits

Nutritionists always declare that food habits are difficult to change; advertising, however, has induced many changes in our dietary habits. The best example is the thousands of new food products available in the market, and purchased by a wide variety of consumers. Many new items and practices become popular, replacing old ones. The shift from breast to bottle feeding, high consumption of sweets and soft drinks, the use of pressure cookers, mixers and many other food utensils, are all examples of these changes. Musaiger (1982) found that about 48.5 per cent of Bahraini housewives purchased the foods seen in television advertisements.

Advertising usually induces many unsound food habits, by putting on view or publicising unnecessary food items, and providing misleading information. Smith et al (1972) found that only 30 per cent of health advertisements provided useful information, while 70 per cent provided misleading or inaccurate information. Resnik and Stern (1977) showed that advertisements for food products tended to be informative in less than 50 per cent of the recorded instances.

Many food companies promote foods which are less nutritious than those formerly used, such as carbonated beverages that have swept into widespread popularity in recent years, and are available in many different places (Ritchie 1967). In the Arabian Gulf States, consumption of fresh foods such as fruit has declined, while sales of canned foods, especially soft drinks and canned sweetened juices have increased. These foods contain mainly sugar, and have a high calorie content, and if taken in large quantities, tend to incline the consumer to suffer from obesity. Other nutrition-related disorders may also arise.

The unfavourable influence of advertising on food habits is clearly apparent in both developing and developed countries. The situation may, however, be more serious in developing countries where low purchasing power, poor hygienic conditions, large family size, illiteracy and lack of effective mutrition education programmes are the main characteristics. Many countries depend on advertising as a financial support for their mass media. Advertising has therefore become a fact of modern life and is likely to increase even in remote areas. The expenditure on advertisements in developing countries has increased dramatically. For instance, in Thailand it rose from $67.8 million in 1979 to $105.8 million in 1981 (Musaiger 1983a).

With the persuasion of advertising, the poor shift from their staple foods to other expensive and less nutritive foods which are claimed to be superior and more healthy. Meckenzie (1969) reported that most people have a relatively fixed amount of money available to spend on food. Thus any change in the money spent on particular food products automatically leads to a change in the money available for other products, with a resultant change in meal pattern. Jelliffe (1972) believed that mothers in the tropics are more vulnerable to the influence of advertising. They often ask for convenience foods even more than do mothers in Western countries. Many researchers (Wennen-Van Der Mey 1969; Jelliffe 1975 and Bader 1976) have reported that advertising and promotional companies are major factors responsible for the gradual decline of breast-feeding in the developing countries. They may also be responsible for the prevalence of marasmus and diarrhoeal diseases in such countries.

Control of Nutrition Claims

Since, in the developing countries, people's understanding of nutrition claims are affected by their level of education and their resultant interpretation of the meaning of terms used in these claims, more consideration should be given to the regulations concerning food advertising claims. These regulations should emphasise the following:

- Definition of advertising
- Form, content and method of making disclosures
- Claims relating emphatically to nutrition
- Claims relating to natural and organic food
- Claims relating to energy food
- Claims relating to fat and cholesterol content
- Claims relating to health foods and associated products
- Claims relating to baby and weaning food

The Need For an Effective Nutrition Education Programme

There is much evidence that the terms used in advertisements and in nutrition education programmes are not clearly understood (Musaiger 1983b; Praun 1982; and Vermeersch and Swenerton 1980). This indicates that people need more information on the meaning of nutrition terms and concepts. An effective nutrition education programme is therefore highly recommended in order to overcome this situation and many other nutrition problems prevalent in the developing countries.

Many factors should be taken into consideration when planning for an effective nutrition education programme. These factors which are mentioned below were noted from the author's experience in the Arabian Gulf States and some parts of Thailand. It should be pointed out that such factors vary from country to another and may not pertain to others.

- Good planning and organization of the programme. It is obvious that the results of any programme of nutrition education will be affected by deficiencies in its planning or organization. Unfortunately not enough attention is given to this aspect, mainly due to lack of experience and poorly defined objectives.
- The need for specialists in nutrition education. In many countries, people involved in nutrition education have little or no background in educational technique. This certainly affects the whole programme, from initial planning to final results.
- Proper selection of foreign experts. Unfortunately some alleged experts in nutrition education have given little help. This is for two reasons. Firstly, some of the experts arriving in developing countries have had to face situations differing totally from those in the developed countries

where they trained and qualified. Though they have usually made every effort to study and understand these unfamiliar environments the process has absorbed much money and time. Frequently, therefore, little progress has been achieved before expiry of their contract and conclusion of the time schedule for the programme. Secondly, the criteria for selection of experts have sometimes been unsuitable.

- The use of appropriate educational techniques. Most of the techniques for nutrition education applied in developing countries are based on preconceived ideas imported from Western countries. In many cases these techniques are improperly used, for example, photographs or films show conditions or people relating to other countries with different traditions and cultures. Another popular activity is the production of pamphlets. In addition to the high cost of such materials, the fact is that majority of people in these countries are either illiterate or cannot fully understand the content of the pamphlet (Praun 1982).
- More confidence in locally qualified people. Insufficient chances to be involved in planning and decision making have been afforded to locally qualified persons. Local graduates could often give a great push to any nutrition education programme, because they were trained in that specific environment and situation. They are more familiar with local resources, the needs of the people and the socio-cultural environment of the community.
- A suitable person in a suitable place. In some circumstances an otherwise well-planned programme may include persons whose qualifications are not in strictly relevant fields, or who lack the ability to pass on their expertise in an understandable way. Suitable personnel could with advantage be selected from existing social, agricultural or health staff as opportunity occurs and be given the necessary training in nutrition education.
- Efficient training of educators and health personnel. Many educators are poorly trained. They have little knowledge of appropriate dynamic techniques, the resources of the community and awareness of people's needs. FAO (1969) reported that one of the greatest needs of developing countries is for more trained personnel, and that training programmes of many different kinds will be prominent in national development plans. The pattern of training and teaching that has evolved in developed countries may not be equally suitable for developing ones, where the pace of change may be more rapid and the needs are very much greater in relation to resources.

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7.4 Workshop Discussion

During the conference, examples of some of the BBC Schools' Television programmes were shown and a variety of printed matter relating to these was available. The programmes made a considerable impact on those who saw them, and were regarded as powerful aids to learning about nutrition.

Of the programmes shown one group was developed to support the teaching of Home Economics to secondary school pupils aged fourteen to sixteen years. The programmes were designed to underpin the science content of such courses. Each programme illustrates one of the areas of modern nutrition knowledge where health risks have been shown to exist in the United Kingdom. The programmes supply relevant evidence from science, history, practical demonstrations and expert reports and cover the following topics:- fats, vitamin C, micro-nutrition, plant foods, choices. The programmes indicate how small changes in the types of food purchased and in food preparation can prevent malnutrition.

Excerpts were also shown of a series of programmes designed for primary schools which focussed on practical science aimed at developing skills such as observation and knowledge of the conditions which promote changes in living things. Nutrition is one of the topics studied in the programmes and is approached through everyday experiences such as purchasing vegetables and other foods. One of the programmes shows how bread is made and encourages pupils to sample different types of bread, and to analyse its taste and structure.

Much stimulating discussion followed the presentation of Abdulrahman Musaiger's paper with its candid appraisal of the situation in his own country. The group examined the importance of high-level political commitment to improve nutrition education. Although they recognised the possible benefits of some regulation of advertisers regarding nutritional claims, a more positive approach to improving nutrition communication was stressed. The classic question was raised "If advertising sells soap, why should it not sell nutrition?" It was pointed out that there may be a difference between promoting a product and promoting a change in customary behaviour. The success of advertising is based on promoting products, and even there it is not always successful.

The group suggested that:-

(a) The problems of malnutrition should receive publicity to create political pressure and motivate political leaders to improve planning and provide the necessary manpower.

(b) There should be an organised programme of research which would clearly define nutrition education goals and test the assumptions regarding advertising techniques and other communication strategies.

Maria Guzman's paper proposed a comprehensive response to the question posed by Dr. Musaiger, namely how to develop more effective nutrition education for the public using the media. She presented a model for developing mass media nutrition in which a strategy is developed based on what she terms a 'diagnosis' and a 'framework'. In the discussion which followed it was decided that the model was not as complex as it appeared. The consensus was that each researcher or developer who might use the model could decide, on the basis of an analysis of the local situation, which parts of the model would be useful. It was felt that this kind of careful planning and analysis could be an important step towards improving education of the public.

Both the papers discussed above challenged us to use the media more effectively in nutrition education. This is perhaps a timely reminder as such means of communication will have an increasingly important role to play in the future as communications networks develop. The work described by Sakorn Dhannamitta was an indication of how the media can be utilised to transmit nutrition messages in an effective way and illustrated how some of the ideas in Maria Guzman's paper could be translated into action.

CHAPTER 8

LOOKING TO THE FUTURE

by

Sheila A. Turner and Richard B. Ingle

'Some hae meat, and canna eat,
  And some wad eat that want it;
But we hae meat and we can eat,
  And sae the Lord be thankit.'

The Selkirk Grace
(attributed to Robert Burns)

The present reality and our hopes for the future are encapsulated in this quotation of one of Scotland's famous poets; if the word 'food' is substituted for 'meat' it has universal meaning. In an ideal world there would be no shortages of food, no malnutrition or poverty. Reality forces us to acknowledge that all three exist in many regions of the world. Furthermore, malnutrition continues in places in which there is a plentiful supply of food and the absence of poverty. Many of the reasons for this state of affairs have been discussed in previous chapters and various suggestions have been made for bringing about improvement. The fact that they have been discussed is itself important. What emerged from our deliberations is the need for continuous and continuing world-wide dialogue between individuals engaged in the wide variety of activities encompassed by the term 'nutrition education'.

The discussion in the plenary session highlighted a number of areas in which progress could be made. First, recognition needs to be given to the fact that nutrition education is essential for everyone; it is not a dispensable luxury. Pressure must be brought to bear on government agencies to bring about a number of important changes. Although government support is a prerequisite for change, it was recognised that many countries lacked the money to support new initiatives in nutrition education.

The importance of training was frequently emphasised during the conference. It is essential that teacher training should include nutrition education as an essential component for all students. This is particularly important for those who are training to become primary school teachers. In many countries primary schools are in a good position to provide universal nutrition education as teachers have more opportunity for contact with children than, for example, health workers in the community. It is essential that the nutrition messages transmitted by teachers and health workers should be consistent. Dialogue between all those engaged in nutrition education is of paramount importance. As Rajammal Devadas stated in her concluding address "the gap between the classroom and the community needs to be bridged."

Many of the papers printed in this book describe recent research and development. It is important that the results of research and evaluation be made available so that they can be made use of in the development of programmes at various levels. Once again the need is for dialogue and effective communication. The importance of the printed word should not be overlooked nor should the need for culturally acceptable teaching materials. The preconference questionnaire showed that there was a widespread lack of suitable teaching materials of all sorts, including reference material related to food and nutrition, as well as of good, up-to-date textbooks in subjects such as Home Economics and Biology for use in secondary schools. Research and development in fields related to nutrition may also provide innovative and practical ideas which can be used in widening the range of strategies of value in teaching nutrition.

The rapid growth of technology, particularly of information and computer technology, has great potential in education. The educational use of the media was discussed in the previous chapter. In many regions of the world this is in its infancy, but in others the use of videotapes and television has exerted a significant influence in both the formal and the non-formal sectors of education. It is already becoming apparent that the advent of cheap microcomputers will have a major impact on education. Although of course they are not essential for the effective teaching of nutrition, they can be most useful in teaching certain aspects of the subject. The use of microcomputers in nutrition education was the subject of one of the workshop meetings at the conference. Discussion centred mainly on their use in schools and colleges in the United Kingdom, although much innovative work has been carried out in other countries such as the United States of America. As Mary Cursiter pointed out, the use of computer technology in schools is hampered at present by a lack of good programs. This affects most school subjects including Home Economics. At Queen Margaret College, Edinburgh, the development of programs started in 1980 in response to requests from home economics advisers. A nutritionist and a computer programmer worked closely together to produce software designed to be relevant, stimulating and educational, and also simple enough for use by those with virtually no previous experience of using computers. Good quality programs are essential if microcomputers are to be used across the curriculum, particularly in teaching aspects of nutrition. School children are usually highly critical of poor computer programs, and are generally more familiar with the new technology (through computer games) than most adults. They are therefore unlikely to be impressed with computers which are used merely as a novelty; the emphasis should be on exploiting the unique characteristics of the computer to expand and improve educational experience.

A range of software programs was demonstrated at the Conference to illustrate the potential value of computers in nutrition education. Delegates were encouraged to develop a critical approach to these programs. It was emphasised that computers should be used to enhance other teaching strategies rather than to replace them. Many of the currently available programs enable experiments and situations which cannot readily be carried out in the classroom to be simulated. A number of examples were shown, including that of a complex physiological control system involving the regulation of blood glucose level. Here, the unique interactive features and dynamic displays of the computer allowed physiological concepts to 'come alive'. Other programs shown allowed students to choose diets and to relate food eaten to energy expenditure. The advantages of such programs lie in their ability to motivate students and enable them to work at their own pace. They can also be of value in encouraging interactive learning and discussion.

Computers can also be used in other ways. Several systems for interfacing, or linking, microcomputers to traditional laboratory equipment were demonstrated. These remove the tedium of making routine sequential measurements. The computer can store results and display them in both tabular and graphical forms. The display may be viewed on the screen or printed on paper to provide a permanent record. Using the computer in this way allows pupils' creative energy to be channelled into the interpretation of experimental findings; it can also add an extra dimension of entertainment and enjoyment to education. A simple calorimeter linked to a microcomputer was demonstrated to illustrate how computers could be used to control experimental procedures and record results more accurately than is normally possible in the classroom. Other uses of microcomputers include their application as a dynamic 'blackboard'. This technique exploits the ability of such machines to draw, for example, three dimensional coloured graphical displays which can be altered in the course of discussion with students. It was pointed out that the use of computers might lead to a loss of the skills normally acquired in learning science. It was agreed that this was something to be guarded against, but the fact remained that the wise use of computers can be of great value in provoking children to ask pertinent questions about the scientific principles underlying their work.

Looking to the future, the group agreed that computers are more than a passing novelty in education. The new technology must be taken seriously in developing new curricula and its unique advantages in education deserve to be imaginatively exploited.

The use of new technology is but one way of developing strategies to meet changing situations. In the rapidly changing world of the twentieth century, it is pertinent to ask whether nutrition education has kept pace. It is clear that nutrition education in many places is facing a crisis of identity. Whose responsibility is it? Where is its place in the school curriculum? These and many other questions require answering. This could be done at meetings to follow up the conference, which could also look at specific problems such as urban nutrition in slums or the development of new curriculum materials. We believe that such meetings allied to a wider correspondence and communication, would help to resolve problems. They will certainly alleviate the problem of isolation experienced by many people.

As an example of the type of coordinated approach to nutrition which has already been advocated in these pages, we would like to draw attention to a particularly interesting initiative which got under way in Ghana in June 1983. A new Nutrition Education Project for Primary Schools was launched at a workshop organised by the Curriculum Research and Development Division of the Ghana Education Service. The participants included primary school teachers, officers from Community Development, the Ministry of Education, the Council on Women and Development, and the Nutrition Division of the Ministry of Health. Further workshops are planned in order to provide teachers with a basic knowledge of nutrition and of media production techniques. Unfortunately, this type of initiative requires a commitment of both finance and technical support, and it is clear that both governments and organisations need to be convinced of their benefit.

In London, a small group composed of nutritionists, dieticians, research workers, teachers from schools, colleges and universities, has started to meet on a regular basis at the Institute of Education to discuss issues of common concern. Undoubtedly one of the strengths of the group is its diversity, although we recognise that it may not be easy to reconcile the needs and requirements of so many interests. It is hoped that these meetings will lead to a greater understanding of the problems faced by those working in the community, in schools and other institutions. We also look forward to a greater consistency in message transmission and to developing more flexible and imaginative teaching strategies. Reports of our discussions are circulated to a wider audience throughout the United Kingdom and it is intended to send brief summaries of our talks to those who attended the Conference from overseas. We hope that the establishment of such communication channels will lead to that continuing dialogue which is so desirable.

In conclusion, we feel that inspite of the many problems and challenges we can take an optimistic view of the future. The Conference was part of a world-wide network of research and development communication. Our hope is that it will lead to further dialogue on ways of bringing about a healthier and more rewarding future for all our children.

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